KE D 1 R.
920

REPORT

OF THE

BOARD OF CONTROL

OF THE

State Institutions of Higher Learning of Florida

FOR THE
BIENNIUM ENDING
JUNE 30, 1920

1921

T. J. APPLEYARD, PRINTER, TALLAHASSEE, FLORIDA

REPORT

OF THE

BOARD OF CONTROL

OF THE

State Institutions of Higher Learning of Florida

FOR THE
BIENNIUM ENDING
JUNE 30, 1920

1921
T. J. APPLEYARD, PRINTER, TALLAHASSEE, FLORIDA

BOARD OF CONTROL

J. B. Hodges, *Chairman*	Lake City
W. W. Flournoy	DeFuniak Springs
H. B. Minium	Jacksonville
J. B. Sutton	Tampa
E. L. Wartmann	Citra
J. T. Diamond, *Secretary*	Tallahassee

~~045092~~

LETTER OF TRANSMITTAL

January 15, 1921.

To His Excellency,
Cary A. Hardee,
Governor of Florida.

SIR:

In compliance with the provisions of Chapter 5384, Laws of Florida, herewith is submitted biennial report of the Board of Control for the period from July 1, 1918, to June 30, 1920, to be by you transmitted to the Legislature.

Respectfully,
BOARD OF CONTROL,
BY J. B. HODGES, Chairman.

EIGHTH BIENNIAL REPORT OF THE BOARD OF CONTROL

INTRODUCTORY.

During the period covered by this report the membership of this Board has fully realized the great responsibilities resting upon it and the importance of the trust imposed in directing the affairs of the State Institutions of Higher Learning of Florida.

Not only has this responsibility been impressed upon us by a realization that in these institutions are being trained the young men and women of our state, who will in the near future begin to fill many of the important stations in the life of the commonwealth, socially, economically and politically, but also on account of the increased burden laid upon the finances provided for the operation and maintaining of these institutions, caused by the enormous advance in price of all classes of materials and commodities, necessitating a most conservative distribution of expenditures.

It is, however, deeply gratifying to this Board to be able to report that a continued progress has been maintained in the several institutions during the biennium, as is evidenced by detailed reports herein set out.

To the patriotic devotion to duty on the part of the presidents and members of the faculties of those institutions is due in large measure the successful administration of their affairs, and this on salaries fixed during normal times when normal prices obtained. In other enterprises and businesses salaries were increased to meet the greatly increased cost of living, yet those engaged in carrying on Florida's Institutions of Higher Learning could not be granted an increase in salary commensurate with prevailing cost of living because the appropriations were not sufficient.

MEMBERSHIPS.

Since the last report the terms of two members of the Board —Mr. E. L. Wartmann, of Citra, and Mr. T. B. King, of Arcadia, have expired. Mr. E. L. Wartmann was re-appointed, and Mr. J. B. Sutton, of Tampa, was appointed to succeed Mr. T. B. King.

Mr. Joe L. Earman resigned to accept an appointment as a member of the State Board of Health, and Mr. H. B. Minium, of Jacksonville, was appointed in his place, and Mr. J. B. Hodges, of Lake City, elected chairman. Mr. J. T. Diamond, having moved into a county where two of the Institutions are located, resigned, and Mr. W. W. Flournoy, of DeFuniak Springs, was appointed in his place.

REPORTS.

Attached hereto are the reports from the four institutions under the management of this Board, viz.:

UNIVERSITY OF FLORIDA.

Page.
Report of A. A. Murphree, A. M., L.L. D., President................ 47
Report of W. B. Ellis, Registrar.................................... 65

COLLEGE OF ARTS AND SCIENCES.

Report of James N. Anderson, M. A., Ph.D., Dean of the College of Arts and Sciences and Professor of Ancient Languages........ 71

COLLEGE OF AGRICULTURE.

Report of P. H. Rolfs, M. S., Dean of the College of Agriculture.... 79

AGRICULTURAL EXPERIMENT STATION.

Report of P. H. Rolfs, M. S., Director of the Agricultural Experiment Station; John M. Scott, Vice Director.................. 99
Report of Animal Industrialist, J. M. Scott......................... 108
Report of the Plant Pathologist, H. E. Stephens.................. 116
Report of the Associate Plant Pathologist, C. B. Sherbaskoff........ 120
Report of the Chemist, R. W. Ruprecht.......................... 123
Report of the Entomologist, J. R. Watson........................ 125
Report of the Plant Physiologist, R. W. Ruprecht.................. 129
Report of Forage Crop Specialist, J. B. Thompson.................. 130
Report of the Assistant Agronomist, J. E. Turlington.............. 132

DIRECTOR'S REPORT OF THE AGRICULTURAL EXTENSION.

Division, A. P. Spencer, Vice Director.......................... 134

COLLEGE OF ENGINEERING.

Page.

Report of J. R. Benton, B. S., Ph.D., Dean of the College of Engineering and Professor of Electrical Engineering.............. 148

COLLEGE OF LAW.

Report of Harry R. Trusler, A. M., L.L. D., Dean of the College of Law and Professor of Law.............................. 160

TEACHERS' COLLEGE AND NORMAL SCHOOL.

Report of Harvey W. Cox, A. M., Ph.D., Dean of Teachers' College and Normal School and Professor of Philosophy and Education 164

ADMINISTRATION.

Report of Cora Miltimore, Librarian............................ 197
Report of K. H. Graham, Auditor.................................. 214
Report of T. Van Hyning, Curator Director of Museum.......... 199

GENERAL EXTENSION DIVISION.

Report of B. C. Riley, Director................................. 170

FLORIDA STATE COLLEGE FOR WOMEN.

Report of Edward Conradi, A. M., Ph.D., President and Professor of Philosophy 221
Report of Wm. G. Dodd, A. M., Ph.D., Dean of the College Arts and Sciences and Professor of English......................... 271
Report of Nathaniel M. Salley, A. B., Dean of the Normal School and Professor of Education.................................. 273
Report of Miss Cora E. Gray, M. S., Dean of School of Home Economics Department 267
Report of Miss Ella Scoble Opperman, A. B., B. M., Dean of the School of Music 269
Report of J. G. Kellum, Business Manager 241

HOME DEMONSTRATION WORK.

Page.
Report of Miss Sarah Waring Partridge, Home Demonstration Agent 244

FLORIDA SCHOOL FOR THE DEAF AND THE BLIND.

Report of A. H. Walker, A. B., D. Lit., President.......... 280

AGRICULTURE AND MECHANICAL COLLEGE FOR NEGROES.

Report of N. B. Young, A. B., President.......... 299
Report of J. F. Wathens, Auditor at A. & M. College.......... 301

These reports by those in direct charge of the several institutions give the progress, condition and needs of the institutions, and will doubtless receive your careful consideration. A detailed description of the work done at the institutions, courses of study, degrees offered, attendance, etc., is given in the annual catalogues of the institutions which we would be glad ot have considered a part of this report.

BUILDINGS AND IMPROVEMENTS.

Improvements have been made during the biennium which have added materially to the efficiency of the institutions. The Board, however, regrets to report that owing to the increased cost of labor and building material it was impossible to secure contracts for the completion of the new buildings within the appropriations made by the Legislature of 1919.

At the Florida State College for Women the Central Heating Plant has been completed to such a stage that it will be used this winter. The addition to Broward Hall Dormitory has been completed to such a stage that it was possible to use it this year. The Annex to Reynolds Hall Dormitory, the First Unit of the Training School, the Hospital Building and the Kitchen, have had the exterior completed, with the exception of the roof. It was necessary to put a temporary roof on all of these buildings, except the First Unit of the Training School, for which we were able to secure a permanent roof within the appropriation. All of these buildings are left unfinished on the interior and cannot be used until appropriations are made to complete them.

On November 30, 1920, East Hall Dormitory, the only wooden dormitory on the campus of the Florida State College for Women, was destroyed by fire. There were ninety young ladies rooming in this building who had to be provided for. In order to meet, as far as possible, this emergency the insurance received from this building and furniture was applied towards the completion of the Annex to Reynolds Hall Dormitory. It was completed to such a stage that it could be occupied by fifty-two young ladies. Until this building could be made available the young ladies were temporarily taken care of in rooms with other young ladies in Bryan, Broward and Reynolds Hall Dormitories.

The greater portion of the furniture and much of the students' belongings were destroyed in this fire. The loss of this dormitory has greatly increased the already urgent need for more dormitory buildings at the College for Women.

The appropriations made in 1919 for the erection of a Primary Building at the School for the Deaf and the Blind, as originally planned, was found to be insufficient. After waiting several months in vain for the cost of labor and material to drop sufficiently for the Board to have this building completed within the appropriation, it decided to carry the work as far towards completion as the funds would permit, so that only a short time would be necessary to complete it when funds are available. All the outside work and a portion of the inside of this building has been finished.

The funds appropriated for the New Boilers, at the School for the Deaf and the Blind, have been used to purchase new boilers and to remodel and repair the heating system.

Appropriations were made by the last session of the Legislature for the erection of an auditorium and a dormitory for girls at the A. and M. College for Negroes. The work on these buildings has been carried as far as the funds would permit. The auditorium is being used temporarily. However, it is not finished. Only a small amount is needed to complete it. All the outside work of the dormitory for girls has been finished.

The appropriation of $2,500 for repairs on Gibbs Hall at the A. and M. College for Negroes has been used. The old assembly room in this building has been remodeled and made into a dining room, and the space formerly used for a dining room has been changed into dormitory space. This change gives much needed dormitory space and a more desirable location for the dining room.

COUNTY CO-OPERATIVE DEMONSTRATION WORK.

The arrangement mentioned in our former biennial reports, whereby were combined the co-operative demonstration work of the United States Department of Agriculture, the Farmers' Institute Work of the State, the Agricultural Extension Division of the University of Florida, and the Home Demonstration Work, conducted by the Florida State College for Women, has been a most pronounced success.

In this connection we wish to call your special attention to the reports of:

	Page.
Acting Director, A. P. Spencer....................................	134
Assistant State Agent, Miss Sarah Waring Partridge, in Charge of Woman's Demonstration Work..............................	244

As you are advised, this extension work is carried on from Federal and State Funds, a large part being from the Federal Smith-Lever Fund, viz.: $10,000 per annum unconditionally and $83,500 for the next biennium upon conditions that the State appropriates a like amount for this work. We recommend that this amount be appropriated. We would suggest that this be made a continuing appropriation.

THE GENERAL EXTENSION DIVISION.

During the biennium covered by this report the General Extension Division of the University has been established. This Department is now giving instruction in almost every subject taught in Grammar Schools, High Schools and Colleges. It has enrolled during the first year of its work 2,149 students. These are unable to attend school or college, and doubtless would not have had the privilege of continuing their course of instruction had this department not been established.

The General Extension Division is giving instructions to many teachers and prospective teachers of the state. Through it many teachers are able to continue their High School or College Work while teaching.

This Department of the University is already reaching more students than its strongest advocates expected it to reach during the first few years of its work. It has proved a blessing to those who are unable, because of various reasons, to attend a High School or College. The Board is well pleased with its work and heartily commends it to the people of the State.

FINANCES.

A complete record of receipts and expenditures for the biennium is shown in the Financial Report of Bryan Mack, Secretary, from July 1, 1918, to June 30, 1919, and from July 1, 1919, to June 30, 1920.

Practically all of the balances shown will be expended by the end of the scholastic year ending June 30, 1921.

The itemized details of our expenditures are shown by the warrants drawn by us on the State Treasurer, Hon. J. C. Luning, and paid by him and set forth in detail in his published report, and hence we are not duplicating these details here.

Tallahassee, Fla., August 1, 1919.

To the Board of Control of Institutions of Higher Learning:

Gentlemen—

The following report of the finances of the Board of Control for the period beginning July 1, 1918, and ending June 30, 1919, is herewith respectfully submitted.

BRYAN MACK,
Secretary Board of Control.

SUMMARY OF AMOUNTS AVAILABLE AND EXPENDITURES FOR THE YEAR BEGINNING JULY 1, 1918, AND ENDING JUNE, 30, 1919.

TOTAL RESOURCES.

Board of Control	$ 3,276.51	
A. & M. College for Negroes	38,449.97	
School for the Deaf and Blind	59,894.29	
Florida State College for Women	184,174.18	
University of Florida	166,504.95	
Experiment Station	54,652.78	
Agricultural Extension Division	55,408.62	
		$562,361.30

TOTAL EXPENDITURES.

Board of Control	$ 3,280.68	
A. & M. College for Negroes	38,291.51	
School for the Deaf and Blind	58,913.68	
Florida State College for Women	180,964.41	
University of Florida	161,028.95	
Experiment Station	50,436.63	
Agricultural Extension Division	55,408.62	
		$548,324.48
Unexpended Balance July 1, 1919		$14,036.82

ITEMIZED STATEMENT FOR EACH INSTITUTION.

BOARD OF CONTROL.

Resources—		
Balance of 1917 Legislative Appropriation brought forward July 1, 1918		$ 3,276.51
Expenditures—		
For Salaries	$ 1,523.89	
For Postage, Stationery and Office Expense	261.99	
For Advertising and Printing	492.25	
For Traveling Expenses	1,002.55	
		$ 3,280.68
Deficit July 1, 1919		$ 4.17

A. & M. COLLEGE FOR NEGROES.

EDUCATIONAL FUND.

Resources—		
Balance of 1917 Legislative Appropriation Brought Forward July 1, 1918		$ 11,000.01
Expenditures—		
For Salaries	$ 7,088.36	
For Equipment, Furniture, Apparatus	986.55	
For Heat, Light and Water	1,290.47	
For Postage, Stationery and Office Expenses	486.77	
For Advertising and Printing	83.96	
For Buildings and Repairs	358.31	
For Traveling Expenses	69.76	
For Miscellaneous Expenses	90.00	
		$ 10,997.43
Unexpended Balance July 1 ,1919		$ 2.58

MORRILL FUND.

Resources—		
Received from Federal Government		$ 25,000.00
Expenditures—		
For Deficit Brought Forward from Previous Year	$ .09	
For Salaries	19,243.00	
For Equipment, Furniture, Apparatus	2,604.41	
For Heat, Light and Water	840.56	
For Postage, Stationery, Office Expenses	177.42	
For Advertising and Printing	4.00	
For Buildings and Repairs	172.77	
For Freight and Express	111.01	
For Feed Stuffs	1,155.16	
For Books and Publications	242.80	
For Miscellaneous Expenses	448.45	
		$ 24,999.67
Unexpended Balance July 1. 1919		$ .33

INCIDENTAL FUND.

Resources—		
Receipts		$ 1,993.41
Expenditures—		
For Salaries	$ 1,201.18	
For Equipment, Furniture, Apparatus	266.72	
For Heat, Light and Water	76.07	
For Postage, Stationery, Office Expense	23.61	
For Advertising and Printing	139.52	
For Buildings and Repairs	20.00	
For Traveling Expenses	4.95	
For Freight and Express	10.76	
For Books and Publications	97.50	
For Miscellaneous Expenses	152.85	
		$ 1,993.16
Unexpended Balance July 1, 1919		$ .25

FIRE LOSS FUND.

Resources—		
Balance Brought Forward July 1, 1918		$ 1.25
Expenditures—		
For Salaries	$ 1.25	

SLATER FUND.

Resources—		
Balance Brought Forward July 1, 1918		$ 5.30
Receipts for Year		450.00
Total Resources		$ 455.30
Expenditures—		
For Salaries	$ 300.00	$ 300.00
Unexpended Balance July 1, 1919		$ 155.30

SCHOOL FOR THE DEAF AND BLIND.

EDUCATIONAL FUND.

Resources—		
Balance Brought Forward July 1, 1918, from 1917 Legislative Appropriation		$ 39,796.49
Amount Transferred from Building Fund		5,119.76
Total Resources		$ 44,916.25
Expenditures—		
For Salaries	$ 20,163.76	
For Equipment, Furniture, Apparatus	4,287.96	
For Heat, Light and Water	3,960.33	
For Postage, Stationery, Office Expenses	682.37	
For Advertising and Printing	52.52	
For Buildings and Repairs	1,000.53	
For Traveling Expenses	1,160.61	
For Freight and Express	391.21	
For Feed Stuffs	12,061.20	
For Books and Publications	156.97	
For Miscellaneous Expenses	998.79	
		$ 44,916.25

INCIDENTAL FUND.

Resources—	
Receipts for Year	$ 578.04
Expenditures—None	
Unexpended Balance July 1, 1919	$ 578.04

BUILDING FUND.

Resources—		
Balance Brought Forward July 1, 1918, from 1917 Legislative Appropriation		$ 19,519.76
Less Amount Transferred to Educational Fund		5,119.76
Total Resources		$ 14,400.00
Expenditures—		
For Reclamation of Land	$ 13,797.43	
For Scholarships	200.00	
		$ 13,997.43
Unexpended Balance July 1, 1919		$ 402.57

FLORIDA STATE COLLEGE FOR WOMEN.

EDUCATIONAL FUND.

Resources—		
Balance Brought Forward July 1, 1918, from 1917 Legislative Appropriation		$ 73,755.90
Expenditures—		
For Salaries	$ 54,821.40	
For Equipment, Furniture, Apparatus	11,086.78	
For Heat, Light and Water	2,049.86	
For Postage, Stationery, Office Expenses	1,410.04	
For Advertising and Printing	661.95	
For Buildings and Repairs	668.05	
For Traveling Expenses	1,120.13	
For Freight and Express	984.28	
For Feed Stuffs	6.78	
For Books and Publications	735.35	
For Miscellaneous Expenses	210.87	
		$ 73,755.43
Unexpended Balance July 1, 1919		$ .47

INCIDENTAL FUND.

Resources—		
Balance Brought Forward July 1, 1918		$ 4,749.10
Receipts for Year		19,400.56
Total Resources		$ 24,149.66
Expenditures—		
For Salaries	$ 19,188.21	
For Equipment, Furniture, Apparatus	1,005.47	
For Heat, Light and Water	433.81	
For Postage, Stationery, Office Expenses	191.44	
For Advertising and Printing	1,545.49	
For Building and Repairs	483.47	
For Traveling Expenses	8.64	
For Freight and Express	18.63	
For Books and Publications	1,073.04	
For Miscellaneous Expenses	216.35	
		$ 24,164.55
Deficit July 1, 1919		$ 14.89

SEMINARY INTEREST FUND.

Resources—		
Balance Brought Forward July 1, 1918		$ 2.57
Receipts from Interest on Bonds		2,064.00
Total Resources		$ 2,066.57
Expenditures—		
For Salaries	$ 2,051.22	
For Equipment, Furniture, Apparatus	14.81	
		$ 2,066.03
Unexpended Balance July 1, 1919		.54

BUILDING FUND.

Resources—		
Balance Brought Forward July 1. 1918		$ 58,999.83
Expenditures—		
For Dormitory and Educational Buildings	$ 51,104.43	
For Purchase of Land	6,000.00	
For Paving	976.16	
		$ 58,080.59
Unexpended Balance July 1, 1919		$ 919.24

SPECIAL BUILDING FUND.

Resources—		
Appropriation by Special Sesion of Legislature		$ 15,000.00
Expenditures—		
For Building Arcade from Reynolds Hall to Dining Room	$ 2,992.50	
For Paving	12,000.00	
		$ 14,992.50
Unexpended Balance July 1, 1919		$ 7.50

EXTENSION FUND.

Resources—		
Appropriation by Special Session of Legislautre...		$ 15,000.00
Expenditures—		
For Building Arcade from Reynolds Hall to Dining Room	$ 2,992.50	
For Paving	12,000.00	
		$ 14,992.50
Unexpended Balance July 1, 1919		$ 7.50

EXTENSION FUND.

Resources—		
Balance Brought Forward July 1, 1918, from 1917 Legislative Appropriation		$ 10,202.22
Expenditures—		
For Women's Institutes	$ 3,458.79	
For Extension Laboratory Equipment	38.70	
For Dairy Specialist	1,979.88	
For Bulletin Writer	1,580.00	
For Printing Bulletins	597.94	
For Summer School	250.00	
		$ 7,905.31
Unexpended Balance July 1, 1919		$ 2,296.91

UNIVERSITY OF FLORIDA.

EDUCATIONAL FUND.

Resources—		
Balance Brought Forward July 1, 1918, from 1917 Legislative Appropriation		$ 63,903.31
For Salaries	$ 44,326.09	
For Equipment, Furniture, Apparatus	6,326.96	
For Heat, Light and Water	1,433.62	
For Postage, Stationery, Office Expenses	1,812.76	
For Advertising and Printing	3,098.17	
For Building and Repairs	1,990.25	
For Traveling Expenses	994.09	
For Freight and Express	1,906.05	
For Feed Stuffs	911.50	
For Books and Publications	655.10	
For Miscellaneous Expenses	450.03	
		$ 63,904.62
Deficit July 1, 1919		$ 1.31

MORRILL FUND.

Resources—		
Received from Federal Government		$ 25,000.00
Expenditures—		
For Salaries	$ 25,000.00	

AGRICULTURAL COLLEGE FUND.

Resources—		
Balance Brought Forward July 1, 1918		$ .33
Received from Interest on Bonds		5,074.00
Appropriation by Legislature to Make Up Deficiency in Interest for Change of Bond Interest.		2,716.00
Total Resources		$ 7,790.33
Expenditures—		
For Salaries	$ 7,790.00	
		$ 7,790.00
Unexpended Balance July 1, 1919............		$ .33

INCIDENTAL FUND.

Resources—		
Brought Forward July 1, 1918		$ 4,152.65
Receipts for the Year		7,157.79
Total Resources		$ 11,310.44
Expenditures—		
For Salaries	$ 8,353.79	
For Equipment, Furniture, Apparatus	244.92	
For Heat, Light and Water	102.86	
For Postage, Stationery, Office Expenses........	56.11	
For Advertising and Printing	292.30	
For Buildings and Repairs	90.98	
For Traveling Expenses	46.52	
For Freight and Express	40.61	
For Feed Stuffs	105.50	
For Books and Publications	39.19	
For Miscellaneous Expenses	82.81	
		$ 9,455.59
Unexpended Balance July 1, 1919...........		$ 1,854.85

SEMINARY INTEREST FUND.

Resources—		
Brought Forward July 1, 1918		$ 4.03
Received from Interest on Bonds		2,064.00
Total Resources		$ 2,068.03
Expenditures—		
For Salaries	$ 2,065.00	
		$ 2,065.00
Unexpended Balance July 1, 1919		$ 3.03

BUILDING FUND.

Resources—		
Brought Forward July 1, 1918, from 1917 Legislative Appropriation		$ 56,432.84
Expenditures—		
New Buildings and Remodeling Others	$ 43,026.75	
General Library	2,944.13	
Law Library	1,234.12	
Campus, Live Stock and Equipment	5,608.74	
		$ 52,813.74
Unexpended Balance July 1, 1919		$ 3,619.10

EXPERIMENT STATION.

ADAMS FUND.

Resources—		
Received from Federal Government		$ 15,000.00
Expenditures—		
For Salaries	$ 11,228.76	
For Equipment, Furniture, Apparatus	1,701.39	
For Heat, Light and Water	60.04	
For Postage, Stationery, Office Expenses	73.97	
For Advertising and Printing	25.95	
For Buildings and Repairs	225.66	
For Traveling Expenses	1,309.94	
For Freight and Express	299.26	
For Books and Publications	54.82	
For Miscellaneous Expenses	20.21	
		$ 15,000.00

HATCH FUND.

Resources—		
Received from Federal Government		$ 15,000.00
Expenditures—		
For Salaries	$ 9,655.34	
For Equipment, Furniture, Apparatus	427.23	
For Heat, Light and Water	210.33	
For Postage, Stationery, Office Expenses	363.38	
For Advertising and Printing	2,509.66	
For Buildings and Repairs	105.35	
For Traveling Expenses	118.97	
For Freight and Express	85.00	
For Feed Stuffs	1,186.50	
For Books and Publications	270.19	
For Miscellaneous Expenses	68.05	
		$ 15,000.00

FIRE LOSS FUND.

Resources—		
Brought Forward July 1, 1918		$ 277.52
Expenditures—		
Equipment, Furniture, Apparatus	$ 235.65	
For Freight and Express	5.70	
		$ 241.35
Unexpended Balance July 1, 1919		$ 36.17

INCIDENTAL FUND.

Resources—		
Brought Forward July 1, 1918		$ 828.25
Receipts for the Year		5,737.92
Total Resources		$ 6,566.17
Expenditures—		
For Salaries	$ 1,043.07	
Equipment, Furniture, Apparatus	329.97	
For Heat, Light and Water	36.55	
For Postage, Stationery, Office Expenses	54.21	
For Advertising and Printing	12.10	
For Buildings and Repairs	10.01	
For Traveling Expenses	165.70	
For Freight and Express	71.46	
For Feed Stuffs	3,752.89	
For Books and Publications	8.00	
For Miscellaneous Expenses	101.93	
		$ 5,585.89
Unexpended Balance July 1, 1919		$ 980.28

FARMERS' INSTITUTES, BULLETINS, ETC., FUND.

Resources—		
Brought Forward July 1, 1918		$ 17,809.09
Expenditures—		
For Farmers' Institutes	$ 5,188.42	
For Clearing Lands	1,194.79	
For Printing Bulletins	4,680.27	
For Current Expenses	3,545.91	
		$ 14,609.39
Unexpended Balance July 1, 1919		$ 3,199.70

AGRICULTURAL EXTENSION DIVISION.

SMITH-LEVER STATE FUND.

Resources—		
Appropriation by 1917 Legislature		$ 22,704.31
Expenditures—		
For Salaries	$ 17,903.37	
For Equipment, Furniture, Apparatus	676.14	
For Postage, Stationery, Office Expenses	872.13	
For Advertising and Printing	106.32	
For Traveling Expenses	3,101.83	
For Freight and Express	16.51	
For Books and Publications	28.01	
		$ 22,704.31

SMITH-LEVER FEDERAL FUND.

Resources—		
Received from Federal Government		$ 32,704.31
Expenditures—		
For Salaries	$ 20,584.73	
For Equipment, Furniture, Apparatus	1,876.95	
For Postage, Stationery, Office Expenses	1,483.51	
For Advertising and Printing	3,472.16	
For Buildings and Repairs	30.23	
For Traveling Expenses	5,161.62	
For Freight and Express	73.04	
For Books and Publications	7.50	
For Miscellaneous Expenses	14.57	
		$ 32,704.31

SECRETARY'S REPORT FOR 1919-1920.

Tallahassee, Fla., August 1, 1920.

To the Board of Control of Institutions of Higher Learning:

Gentlemen—

The following report of the finances of the Board of Control for the period beginning July 1, 1919, and ending June 30, 1920, is herewith respectfully submitted.

BRYAN MACK,
Secretary Board of Control.

SUMMARY OF AMOUNTS AVAILABLE AND EXPENDITURES FOR THE YEAR BEGINNING JULY 1, 1919, AND ENDING JUNE 30, 1920.

TOTAL RESOURCES.

Board of Control	$ 8,000.00	
A. & M. College for Negroes	78,871.81	
School for the Deaf and Blind	174,287.54	
Florida State College for Women	398,800.33	
University of Florida	268,513.42	
Experiment Station	60,014.37	
Agricultural Extension Division	82,437.57	
		$1,070,925.03

TOTAL EXPENDITURES.

Board of Control	$ 3,542.28	
A. & M. College for Negroes	60,049.66	
School for the Deaf and Blind	94,607.56	
Florida State College for Women	186,176.76	
University of Florida	174,441.91	
Experiment Station	51,022.43	
Agricultural Extension Division	82,437.57	
		$652,278.17
Unexpended Balance July 1, 1920		$418,646.86

ITEMIZED EXPENDITURES FOR EACH INSTITUTION.

BOARD OF CONTROL.

Resources—		
Appropriation by 1919 Legislature		$ 8,000.00
Expenditures—		
For Salaries	$ 1,354.96	
For Postage, Stationery, Office Expenses	398.67	
For Advertising and Printing	10.25	
For Traveling Expenses	1,766.46	
For Freight and Express	3.67	
For Miscellaneous Expenses	4.10	
For Deficit from Previous Year	4.17	
		$ 3,542.28
Unexpended Balance July 1, 1920		$ 4,457.72

A. & M. COLLEGE FOR NEGROES.

EDUCATIONAL FUND.

Resources—		
Balance Brought Forward July 1, 1919		$ 2.58
Expenditures—		
For Postage, Stationery, Office Expenses	$ 2.58	

CURRENT EXPENSE FUND.

Resources—		
Appropriation by 1919 Legislature		$ 24,000.00
Expenditures—		
For Salaries	$ 7,979.09	
For Equipment, Furniture, Apparatus	1,396.88	
For Heat, Light and Water	1,541.86	
For Postage, Stationery, Office Expenses	185.39	
For Advertising and Printing	54.25	
For Buildings and Repairs	849.07	
For Traveling Expenses	236.77	
For Freight and Express	270.51	
For Feed Stuffs	159.00	
For Miscellaneous Expenses	90.50	
		$ 13,063.32
Unexpended Balance July 1, 1920		$ 10,936.68

MORRILL FUND.

Resources—		
Brought Forward July 1, 1919		$ .33
Received from Federal Government		$ 25,000.00
Total Resources		$ 25,000.33
Expenditures—		
For Salaries	$ 20,460.50	
For Equipment, Furniture, Apparatus	3,099.16	
For Heat. Light and Water	1,001.96	
For Postage, Stationery, Office Expenses	90.63	
For Advertising and Printing	63.68	
For Buildings and Repairs	332.56	
For Traveling Expenses	.50	
For Freight and Express	59.04	
Fod Feed Stuffs	880.08	
For Books and Publications	316.78	
For Miscellaneous Expenses	5.39	
		$ 26,310.28
Deficit July 1, 1920		$ 1,309.95

INCIDENTAL FUND.

Resources—		
Brought Forward July 1, 1919		$ .25
Receipts for the Year		4,263.35
Total Resources		$ 4,263.60
Expenditures—		
For Salaries	$ 1,907.68	
For Equipment, Furniture, Apparatus	852.35	
For Heat. Light and Water	509.33	
For Postage, Stationery, Office Expenses	28.55	
For Advertising and Printing	185.83	
For Buildings and Repairs	127.42	
For Traveling Expenses	2.50	
For Freight and Express	169.35	
For Feed Stuffs	352.72	
For Books and Publications	2.25	
For Miscellaneous Expenses	112.50	
		$ 4,250.48
Unexpended Balance July 1, 1920		$ 13.12

SLATER FUND.

Resources—		
Brought Forward July 1, 1919		$ 155.30
Receipts for Year		450.00
Total Resources		$ 605.30
Expenditures—		
For Salaries	$ 600.00	
		$ 600.00
Unexpended Balance July 1, 1920		$ 5.30

BUILDING FUND.

Resources—		
Appropriation by 1919 Legislature		$ 5,000.00
Expenditures—		
For Dormitory	$ 8,893.50	
For Auditorium	6,929.50	
		$ 15,823.00
Unexpended Balance July 1, 1920		$ 9,177.00

SCHOOL FOR THE DEAF AND BLIND.

CURRENT EXPENSE FUND.

Resources—		
Appropriation by 1919 Legislature		$120,000.00
Expenditures—		
For Salaries	$ 24,363.29	
For Equipment, Furniture, Apparatus	4,512.74	
For Heat, Light and Water	3,339.20	
For Postage, Stationery, Office Expenses	700.84	
For Advertising and Printing	27.13	
For Buildings and Repairs	387.41	
For Traveling Expenses	954.76	
For Freight and Express	1,737.23	
For Feed Stuffs	15,222.65	
For Books and Publications	162.29	
For Miscellaneous Expenses	1,089.99	
		$ 52,497.53
Unexpended Balance July 1, 1920		$ 67,502.47

INCIDENTAL FUND.

Brought Forward July 1, 1919	$ 578.04
Receipts for the Year	209.50
Total Resources	$ 787.54
Expenditures—None.	
Balance July 1, 1920	$ 787.54

BUILDING FUND.

Resources—		
Appropriation by 1919 Legislature		$ 53,500.00
Expenditures—		
For Primary Building	$ 38,036.75	
For Special Repairs	1,455.82	
For Athletics	143.88	
For Library, Pianos and Apparatus	1,973.58	
For Scholarships	500.00	
		$ 42,110.03
		$ 11,389.97

FLORIDA STATE COLLEGE FOR WOMEN.

CURRENT EXPENSE FUND.

Resources—		
Appropriation by 1919 Legislature		$195,000.00
Expenditures—		
For Salaries	$ 83,294.04	
For Equipment, Furniture, Apparatus	11,253.72	
For Heat, Light and Water	1,714.57	
For Postage, Stationery, Office Expenses	2,102.96	
For Advertising and Printing	1,512.80	
For Buildings and Repairs	1,512.80	
For Traveling Expenses	680.56	
For Freight and Express	1,187.95	
For Feed Stuffs	12.49	
For Books and Publications	1,849.50	
For Miscellaneous Expenses	680.48	
		$105,801.87
Unexpended Balance July 1, 1920		$ 89,198.13

INCIDENTAL FUND.

Resources—		
Receipts for the Year		$ 21,895.13
Expenditures—		
For Salaries	$ 10,065.75	
For Equipment, Furniture, Apparatus	671.02	
For Heat, Light and Water	399.77	
For Postage, Stationery, Office Expenses	219.82	
For Advertising and Printing	128.88	
For Buildings and Repairs	188.00	
For Books and Publications	15.75	
For Miscellaneous Expenses	1.09	
Deficit from Previous Year	14.89	
		$ 11,704.97
Unexpended Balance July 1, 1920		$ 10,190.16

SEMINARY INTEREST FUND.

Resources—	
Brought Forward July 1, 1919	$ .54
Received from Interest on Bonds	2,107.75
Total Resources	$ 2,108.29
Expenditures—None.	
Unexpended Balance July 1, 1920	$ 2,108.29

BUILDING FUND.

Resources—		
Appropriation by 1919 Legislature		$152,500.00
Expenditures—		
For Equipment for Broward Hall	$ 1,415.80	
For Central Heating Plant	13,260.97	
For Completing Broward Hall	9,261.00	
For Infirmary Building	8,757.45	
For Extension to Reynolds Hall Dormitory	13,502.50	
For First Unit Training School	4,627.50	
For Completing Kitchen	5,593.00	
		$ 56,418.22
Unexpended Balance July 1, 1920		$ 96,081.78

EXTENSION FUND.

Resources—		
Brought Forward July 1, 1919		$ 2,296.91
Appropriation by 1919 Legislature		25,000.00
Total Resources		$ 27,296.91
Expenditures—		
For Summer School Extension Workers	$ 1,200.00	
Dairy Specialist	1,761.46	
Printing Fund	691.23	
Equipment for Research Work	311.16	
For Janitor Service	46.50	
For Assistant Research Work	900.00	
For Assistant Home Demonstration Agent	1,999.83	
For Women's Institutes	2,534.71	
For Practice House Rent and Office Supplies	360.00	
For Miscellaneous Expenses	2,283.59	
For Amount Not Allowed by Comptroller	13.32	
		$ 12,101.80
Unexpended Balance July 1, 1920		$ 15,195.11

UNIVERSITY OF FLORIDA.

CURRENT EXPENSES FUND.

Resources—		
Appropriation by 1919 Legislature		$156,000.00
Expenditures—		
For Overdraft as Shown by Previous Report	$ 1.31	
For Salaries	65,725.59	
For Furniture, Equipment, Apparatus	2,273.01	
For Heat, Light and Water	1,579.27	
For Postage, Stationery, Office Supplies	1,064.93	
For Advertising and Printing	2,660.68	
For Buildings and Repairs	1,108.28	
For Traveling Expenses	1,176.72	
For Freight and Express	1,139.18	
For Feed Stuffs	849.68	
For Books and Publications	22.74	
For Miscellaneous Expenses	389.73	
		$ 77,991.02
Unexpended Balance July 1, 1920		$ 78,008.98

MORRILL FUND.

Resources—		
Received from Federal Government		$ 25,000.00
Expenditures—		
For Salaries	$ 25,000.00	
		$ 25,000.00

INCIDENTAL FUND.

Resources—		
Brought Forward July 1, 1919		$ 1,854.85
Receipts for the Year		11,729.42
Total Resources		$ 13,584.27
Expenditures—		
For Salaries	$ 7,488.85	
For Equipment, Furniture, Apparatus	1,094.28	
For Heat, Light and Water	274.01	
For Postage, Stationery, Office Expenses	813.81	
For Advertising and Printing	847.64	
For Buildings and Repairs	187.93	
For Traveling Expenses	766.54	
For Freight and Express	92.62	
For Feed Stuffs	602.80	
For Books and Publications	8.57	
For Miscellaneous Expenses	678.92	
		$ 12,855.97
Unexpended Balance July 1, 1920		$ 728.30

SEMINARY INTEREST FUND.

Brougnt Forward July 1, 1919		$ 3.03
Receipts from Interest on Bonds		2,107.75
Total Resources		$ 2,110.78
Expenditures—		
For Salaries	$ 2,109.16	
		$ 2,109.16
Unexpended Balance July 1, 1920		$ 1.62

AGRICULTURAL COLLEGE FUND.

Resources—		
Brought Forward July 1, 1919		$ .33
Receipts from Interest on Bonds		4,982.93
Legislative Appropriation to Make Up Interest Deficiency on Account Change in Bonds		2,716.00
Total Resources		$ 7,699.26
Expenditures—		
For Salaries	$ 7,733.19	
		$ 7,733.19
Deficit July 1, 1920		$ 33.93

BUILDING FUND.

Resources—		
Brought Forward July 1, 1919		$ 3,619.10
Appropriation 1919 Legislature		35,500.00
Total Resources		$ 39,119.10
Expenditures—		
For Current Expenses, Library, Laboratories	$ 8,401.15	
For New Equipment, Libraries, Laboratories	14,483.59	
For Law Library	1,495.45	
For Campus, Live Stock, Etc.	214.81	
For Amount Not Allowed by Comptroller	1,908.84	
		$ 26,503.84
Unexpended Balance July 1, 1920		$ 12,615.26

GENERAL EXTENSION FUNDS.

Resources—		
Appropriation by 1919 Legislature		$ 25,000.00
Expenditures—		
For Filing Cases, Writing Machines, Etc.	$ 541.48	
For Purchase Slides and Films	941.54	
For Purchase Correspondence Cources	1,158.20	
For Stamps	1,161.11	
For Printing	1,611.58	
For Subscriptions and Periodicals	498.15	
For Traveling Expenses and Contingencies	4,306.39	
For Salaries, Etc.	12,031.59	
		$ 22,250.04
Unexpended Balance July 1, 1920		$ 2,749.96

EXPERIMENT STATION.

CONTINUING CERTAIN EXPERIMENTS FUND.

Resources—

Appropriation by 1919 Legislature		$ 10,000.00

Expenditures—

For Salaries	$ 2,965.09	
For Equipment, Furniture, Apparatus	973.43	
For Heat, Light and Water	19.96	
For Buildings and Repairs	73.90	
For Freight and Express	9.46	
For Feed Stuffs	791.85	
		$ 4,833.69
		$5,166.31

ADAMS FUND.

Resources—

Received from Federal Government		$ 15,000.00

Expenditures—

For Salaries	$ 11,062.73	
For Equipment, Furniture, Apparatus	1,876.20	
For Heat, Light and Water	60.94	
For Postage, Stationery, Office Expenses	148.79	
For Advertising and Printing	10.09	
For Buildings and Repairs	109.67	
For Traveling Expenses	1,590.39	
For Freight and Express	119.83	
For Books and Publications	13.45	
For Miscellaneous Expenses	7.91	
		$ 15,000.00

HATCH FUND.

Resources—		
Received from Federal Government		$ 15,000.00
Expenditures—		
For Salaries	$ 10,108.34	
For Equipment, Furniture, Apparatus	249.73	
For Heat, Light and Water	294.75	
For Postage, Stationery, Office Supplies	525.77	
For Advertising and Printing	1,765.91	
For Buildings and Repairs	140.47	
For Traveling Expenses	144.76	
For Freight and Express	78.37	
For Feed Stuffs	1,351.55	
For Books and Publications	317.04	
For Miscellaneous Expenses	23.31	
		$ 15,000.00

INCIDENTAL FUND.

Resources—		
Brought Forward July 1, 1919		$ 980.28
Receipts for the Year		5,834.39
Total Resources		$ 6,814.67
Expenditures—		
For Salaries	$ 936.62	
For Equipment, Furniture, Apparatus	350.62	
For Heat, Light and Water	25.53	
For Postage, Stationery, Office Expenses	29.36	
For Advertising and Printing	57.00	
For Buildings and Repairs	147.85	
Traveling Expenses	59.73	
For Freight and Express	234.96	
For Feed Stuffs	4,291.54	
For Books and Publications	1.87	
For Miscellaneous Expenses	446.75	
		$ 6,581.83
Unexpended Balance July 1, 1920		$ 232.84

FARMERS' INSTITUTES, BULLETINS, ETC.

Resources—		
Brought Forward July 1, 1919		$ 3,199.70
Expenditures—		
For Farmers' Institutes	$ 874.96	
For Amount Not Allowed by Comptroller	2,324.74	
		$ 3,199.70

WINTER HAVEN SUB-STATION FUND.

Resources—		
By Donations from Citizens of Polk County		$ 10,000.00
Expenditures—		
For Purchase of Land	$ 5,900.00	
For Upkeep of Grove and Supplies	507.21	
		$ 6,407.21
Unexpended Balance July 1, 1920		$ 3,592.79

AGRICULTURAL EXTENSION DIVISION.

SMITH-LEVER STATE FUND.

Resources—		
Appropriation of 1919 Legislature		$ 28,110.10
Expenditures—		
For Salaries	$ 17,890.36	
For Equipment, Furniture, Apparatus	74.77	
For Postage, Stationery, Office Expenses	460.21	
For Advertising and Printing	444.21	
For Traveling Expenses	9,231.89	
For Freight and Express	5.71	
For Miscellaneous Expenses	2.95	
		$ 28,110.10

SMITH-LEVER FEDERAL FUND.

Resources—		
Received from Federal Government		$ 38,110.10
Expenditures—		
For Salaries	$ 23,551.29	
For Equipment, Furniture, Apparatus	353.36	
For Postage, Stationery, Office Expenses	1,061.11	
For Advertising and Printing	3,529.31	
For Buildings and Repairs	68.16	
For Traveling Expenses	9,444.84	
For Freight and Express	62.53	
For Books and Publications	3.00	
For Miscellaneous Expenses	36.50	
		$ 38,110.10

LEVER SUPPLEMENTAL FUND.

Resources—		
Received from Federal Government		$ 16,217.37
Expenditures—		
For Salaries	$ 14,780.74	
For Postage, Stationery, Office Expenses	53.21	
For Advertising and Printing	405.50	
For Traveling Expenses	977.92	
		$ 16,217.37

RECOMMENDATIONS.

We have carefully gone over with the president of each institution, and considered all recommendations; and from such examination, and from our knowledge of the conditions of the Institutions, we feel that in order that the Institutions may continue a healthy and economic growth and supply the demands made upon them by the citizens of our State, the following appropriations for the biennium will be necessary, and respectfully recommend that such appropriations be made, viz.:

RECOMMENDATIONS FOR APPROPRIATIONS. UNIVERSITY OF FLORIDA.

Buildings and Improvements.

Upkeep and Equipment............		$ 628,610.00
Current Expenses, Salaries, Repairs,		
Unit of Administration Building, Assembly Room, Library and State Museum	$150,000.00	
Dormitory and Equipment...........	100,000.00	
Enlargement of Dining Hall and Kitchen	40,000.00	
Extension of Central Heating Plant...	40,000.00	
Students Hospital Building...........	40,000.00	
		$ 370,000.00

General Extension.

Operating Expenses		60,000.00

Co-operative Farm and Home Demonstration Work.

Amount to match Federal Aid for year ending June 30, 1922................	39,000.00	
Amount to match Federal Aid for year ending June 30, 1923................	44,500.00	83,500.00
Total for University.............		$1,142,100.00

EXPERIMENT STATION.

Current Expenses, Administrative Department	$ 37,900.00	
Animal Industry and Field Crops	140,290.00	
Sugar Cane Experimental and Field Work	20,000.00	
Experiments in Soil and Fertilizers	35,000.00	
Pecan Investigations and Field Work	15,000.00	
Plant Pathological Work	73,400.00	
Experiments in Entomology	29,900.00	
Experiment Test Grounds	7,150.00	
Experiment Station Library	7,400.00	
Branch Experiment Station (at Lake Alfred)	31,300.00	
Total		$ 397,340.00
Less Amount Received from U. S. Government		60,000.00
Total Experiment Station		$ 337,340.00

FLORIDA COLLEGE FOR WOMEN.

Current Expenses, Salaries, Repairs, Upkeep and Equipment	$ 419,100.00

Buildings and Improvements.

Dormitories	$230,000.00	
Equipment for Same	17,500.00	
Completion of Dining Room	60,000.00	
Equipment for Same	3,000.00	
Home Economics and Chemistry Bldg.	100,000.00	
Equipment for Same	12,000.00	
Addition to Training School	25,000.00	
Equipment for Same	1,000.00	
An Additional Boiler, Heating Plant	2,000.00	
Grounds, Grading, Walks, etc.	12,000.00	
Changes in Administration Building	1,500.00	
Practice House	15,000.00	
Laundry	20,000.00	
Poultry Farm	5,000.00	
Dairy Room and Dairy Herd	8,000.00	
		$ 512,000.00

Amount Needed to Complete and Equip Buildings Under Construction.

Reynolds Hall Addition	$ 5,000.00	
Infirmary	37,000.00	
Equipment for Same	1,000.00	
Broward Hall	8,000.00	
Training School	15,000.00	
Kitchen	17,000.00	
Equipment	10,000.00	
		$ 93,000.00

Extension Work.

Home Demonstration Work	39,200.00
Total	$1,063,300.00

FLORIDA SCHOOL FOR THE DEAF AND THE BLIND.

Current Expenses		$ 160,000.00
Buildings and Improvements.		
Completing Present Primary Building.	$ 25,000.00	
Additional Primary Building.........	75,000.00	
Equipment Above Two Buildings.....	10,000.00	
Dining Room, Kitchen and Laundry for Colored Department, also Quarters for Servants and Equipment for Same	45,000.00	
Bulkheading, Leveling and Sodding...	25,000.00	
Fire Protection	17,500.00	
Extension Department	7,500.00	
General Repairs	6,000.00	
Dairy Herd and Addition to Barn....	5,000.00	
Tiling Dining Room Floors and Screening Windows and Doors of Dormitories	3,000.00	
Electric Time and Program Clock and Bell System	2,000.00	
Play Ground Apparatus..............	2,500.00	
Library	2,000.00	
Scholarships	1,500.00	
Drying Room for Laundry............	1,500.00	
Making Furnace Rooms in Hospital and Building for Colored Pupils Water Tight	1,200.00	
Athletic	500.00	
Equipment for Industrial Department.	500.00	230,700.00
Total		$ 390,700.00

AGRICULTURAL AND MECHANICAL COLLEGE FOR NEGROES.

Current Expenses		$ 40,000.00

Buildings and Improvements.

Finishing and Furnishing New Buildings	$ 15,000.00	
Boys' Dormitory	25,000.00	
Training School Annex for Manual Training	3,000.00	
Sanatorium Annex and Nurses' Home.	5,000.00	
Cottage for Contagious Diseases......	3,000.00	
Silos, Implement and Stock Sheds, and Poultry Houses	4,000.00	60,000.00
Painting and Renovating Buildings..	5,000.00	
Total		$ 100,000.00
Board of Control: Operating Expense.		10,000.00
Summer Schools: Operating Expense..		30,000.00

In making these recommendations for appropriations from the Legislature the Board realizes that it has asked for a large amount for buildings and equipment. However, the Board has thoroughly considered every need and has not asked for a single item that is unnecessary, if the Institutions of Higher Learning are to meet the needs of the people of our rapidly growing State.

The need of more dormitories, class rooms and additional dining room space at the University and Florida State College for Women is fully demonstrated by the fact that we have had to turn away hundreds of Florida young women, who have applied for admission the past two years, for want of rooms to accommodate them. At the University the greater portion of the young men have to room in the city anywhere they can find accommodations, many times more than a mile away from their work. But without more class rooms and increased dining room facilities we could not take care of any more even thoug we had the dormitory space, for already all the buildings at the Florida State

College for Women, and at the University are, and have been for some time, congested.

Your Board feels that these conditions ought not to prevail. No citizen, however humble, should be required to support our Institutions of Higher Learning and then be denied the privilege of sending his son or daughter to them because "There is no more room." It is the duty of the State to give all of its citizens equal opportunities.

The School for the Deaf and the Blind at St. Augustine is also crowded to the limit. The State cannot afford to neglect its duty in providing proper educational facilities for those unfortunate children in order that they may become self-supporting citizens instead of objects of charity. At present there are many such children in the State not in this school, and your Board is unable to urge that they attend because of a lack of buildings and equipment.

The Agricultural and Mechanical College for Negroes has never received sufficient appropriations to give it proper accommodations to meet efficiently the demands for industrial education. The Board feels that the State should provide sufficient accommodations for an industrial education for the negroes of our State, and with that view we recommend the above appropriations.

Regarding the amounts for operating expenses we beg to say the increases over the last appropriations are made necessary by the growth of the institutions and the great increase in the cost of supplies and living expenses, making higher salaries necessary. (At present the teachers of our State Institutions are receiving lower salaries than are being paid in any other like institutions in the country). During the past biennium our State has lost the services of many of its most valuable professors. In some instances your Board did not have the funds necessary to pay them fifty per cent. of what they were offered by other institutions to do similar work.

Among those whose estimable services the State has lost may be mentioned Dr. P. H. Rolfs, Dean of the College of Agriculture and Director of the Experiment Station, who has gone to the Republic of Brazil to do similar work at a salary of $12,000 per annum.

Dr. Harvey W. Cox, Dean of the College of Education at the State University, has accepted the Presidency of Emory University, one of the South's great Educational Institutions, at a salary of $7,000 per year.

Miss Agnes Ellen Harris, Dean of the College of Home Economics and Director of Home Demonstration work at the Florida State College for Women, accepted similar work in Texas at a salary far above what this Board could pay.

Not only are the institutions growing in attendance, but more courses of study and departments are needed to meet the increasing demands of our people.

In conclusion, we are pleased to state that all the institutions have had a very successful two years. They have grown in numbers, strength and efficiency and influence, and we are able more and more to give our people what they have the right to expect from their State Institutions of Learning.

The faculties have been faithful and efficient, and the students have done earnest work in laying a broad foundation for good and useful citizenship. The good work and high standards of our institutions are becoming better known and appreciated throughout the State each year, and our citizens are realizing more than ever before that they have institutions of learning of which they may be justly proud.

The liberal policy of the Legislature toward the institutions has largely been responsible for these gratifying results, and has demonstrated the fact that money so used is not money spent, but money wisely invested.

Respectfully submitted,
BOARD OF CONTROL.
By J. B. Hodges, Chairman.
Tallahassee, Fla., Jan. 19, 1921.

THIS TABLE SHOWS THE GROWTH IN ATTENDANCE OF EACH INSTITUTION.

Different Years Since the Institutions Were Established.	1905-1906	1906-1907	1907-1908	1908-1909	1909-1910	1910-1911	1911-1912	1912-1913	1913-1914	Including Summer School 1913-1914	1914-1915	Including Summer School 1914-1915
University of Florida	136	102	103	103	186	241	302	321	349	489	378	647
Florida State College for Women	204	229	240	257	273	290	315	413	417	477	473	636
School for the Deaf and the Blind	88	89	97	90	105	113	111	119	135	....	137	....
The A. & M. College for Negroes	280	294	307	280	274	314	361	379	433	597	423	537
Totals	708	706	747	730	838	958	1,089	1,232	1,334	....	1,411	....

THIS TABLE SHOWS THE GROWTH IN ATTENDANCE OF EACH INSTITUTION.

Different Years Since the Institutions Were Established.	1915-1916	Including Summer School 1915-1916	1916-1917	Including Summer School 1916-1917	1917-1918	Including Summer School 1917-1918	1918-1919	Including Summer School 1918-1919	Student Army Training Corps	1919-1920	Including Summer School 1919-1920	General Extension Division
University of Florida	436	810	414	953	370	863	554	988	676	664	1,276	2,149
Florida State College for Women	551	810	596	959	587	993	627	1,177	.....	691	1,160	.....
School for the Deaf and the Blind	146	...	150	.....	156	.....	171	.....	.....	187	.....	.....
The A. & M. College for Negroes	354	506	336	.....	316	.....	312	429	.....	339	546	.....
Totals	1,487	...	1,496	.....	1,429	.....	1,664	.....	.....	1,881	.....	.....

Hon. John T. Diamond,
Secretary Board of Control,
Capitol.

My Dear Sir:

In compliance with Section 8, Chapter 6835, Acts of 1915, or Section 641 of the Revised General Statutes, I hereby make request of the Board of Control to include in its budget for higher education a summer school appropriation of $15,000 per year for the years 1921 and 1922—a total of $30,000.

Yours very truly,

W. N. SHEATS,
State Superintendent.

PRESIDENT'S BIENNIAL REPORT, UNIVERSITY OF FLORIDA

To the Honorable Board of Control,
Institutions of Higher Learning:

Gentlemen—

I herewith submit the biennial report of the status of the University, reviewing the work of the past two years and forecasting the needs of the institution for the coming biennial period. The detailed statement of the University's condition is contained in the accompanying reports of the Deans and other officers in immediate charge of the various activities; and it remains for me only to call attention to the general situation with which we are confronted.

This situation may be summed up in a single word: The University is facing, not a crisis, but *the* crisis in its existence. The fate of the institution will be definitely determined by the action of the Legislature of 1921 with reference to its budget. If it receives adequate financial support, the University will undoubtedly become one of the great State Universities of the country; if support fails, it must inevitably sink to a position far below its present status.

This crisis, which had been gradually growing under normal conditions, was precipitated with unexpected and alarming suddenness by two fundamental changes which grew out of our participation in the World War. The first of these is too well known to need more than barest mention—**the great decrease in the purchasing power of the dollar.** The second is made equally obvious by a glance at the figures—**the great increase in the number of students at the University.** Their joint effect has been to revolutionize the financial needs of the institution of its promise of growth is not to be blighted.

The measure of an institution's growth is a two-fold one—quantitative and qualitative; the number of students trained, and the excellence of the training given. The quantitative growth of your University is assured; more students are applying for admission than can possibly be matriculated, and your officers and faculty find themselves embarrassed by the present overcrowded condition. The quality of instruction which each student can receive under the present conditions is rapidly deteriorating, and such deterioration unless immediately checked must in turn react on the attendance, and that also will begin to fall off. The inevitable result will be that the marvelous, almost unprecedented, growth of the University of Florida, which has excited not only the pride of the State but the admiration of the educational world, will be lost.

This deterioration is directly due to the two basic facts mentioned above—the decreased dollar and the increased attendance; and manifests itself.

broadly considered, in two directions: (1) In the corps of instructors; (2) in the physical equipment of the plant. The efficiency of the corps of instructors is measured by two considerations—(a) the ability of the individual instructor, and (b) the proportion of instructors to students. The efficiency of the educational plant is measured—(a) by the adequacy and steadiness of the supply of such commodities as are consumed from day to day and listed under a current expense account; (b) by the amount of more or less permanent addition and improvement to the plant; (c) by the buildings needed to house the plant. These various phases of the subject will be discussed in order.

I, a—THE FACULTY.

The fundamental factor in determining the efficiency of an educational institution is its staff of instructors. Inefficiency in the teaching force cannot be compensated for by any amount of expenditure in other directions, while an efficient teaching force may compensate for very grave deficiencies in other things. The value of the institution is absolutely measured by the quality of the instruction, and the quality of the instruction is mainly determined by the ability of the instructor. This proposition, is I take it, obvious and axiomatic in education.

A second proposition is equally true. Due allowance being made for exceptional conditions, it is broadly the fact that the salary scale paid by an institution measures the ability of its teachers; the institution able to offer the largest salary will in the long run and on the whole command the best men.

With these two propositions in mind, attention should next be called to the exceptional conditions under which the Faculty of the University of Florida was assembled and recruited during its earlier years. Any one conversant with the facts knows that there has always existed a startling discrepancy between the size of the school and the salaries paid on the one hand and on the other the ability of the men who compose its Faculty. For years the institution succeeded in obtaining men of marked ability, though its student body was less than 200 and its salary scale fell far below that of schools of like standing in neighboring states. The explanation is fairly obvious. The teachers enlisted were young and without large families, and so did not feel the need of large salary; they were ambitious and were attracted by the new and inspiring educational venture; they desired the Florida climate, and frankly accepted the climatic conditions as part of their salary.

This conjunction of fortunate conditions could not continue indefinitely. Even before the World War the low salary scale was beginning to produce its inevitable result. As time went on, larger families to support had grown up around the instructors; they themselves had become men of riper scholarship, of larger experience as teachers, and of wider reputation and influence in the educational world. As a consequence institutions with larger salaries to offer were requesting their services, and several had already resigned on this account before the war.

The economic condition produced by the war has doubled and trebled this pressure. The great increase in attendance at all colleges and universities of the country has tremendously increased the demand for men prepared to teach, while the supply has been appreciably lessened by numbers of qualified teachers going into commercial life. The Faculty of the University of Florida has felt the full force of this condition. A considerable number of our best men have accepted positions in other institutions and in the commercial world at salaries from 75% to 150% higher than we could pay. It is becoming increasingly difficult, if not impossible, to replace these men.

Those who remain, largely through attachment to the University and in hopes of speedy relief, are finding their efficiency crippled by constant worry over their finances and several have faced serious loss in spite of utmost economy. And it is only just to say that they cannot be expected to remain indefinitely under such conditions.

These conditions have been met throughout the country in every department of education from the primary school in the small rural district to the greatest University in the land by the only possible remedy—an adequate increase in the salary scale. Privately endowed foundations have, through their alumni and friends, increased their endowments two, three and fourfold; denominational schools have benefited by unprecedented assessments upon their churches; tax-supported institutions have had their appropriations enormously raised. It is no exaggeration to say that I know of no institution of higher learning anywhere in the United States which has not made earnest and successful effort to meet this situation by increasing its income and raising very substantially its salary scale.

If the University of Florida fails to keep pace with this movement, its usefulness to the State will be disastrously impaired because, in that event, it must inevitably replace its present faculty of exceptional ability with one of second or third rate powers.

I, b—THE NUMBER OF INSTRUCTORS.

A second measure of the efficiency of an institution is the number of instructors on its teaching staff as compared with the number of students. In general the situation is this: If one school has one instructor to every ten students and a second school has one instructor to every twenty students, then it is probable that under normal conditions the instruction at the former school will be twice as efficient as that at the latter. A teacher has a given amount of time and energy at his disposal. It is usually expended in the following ways: So many hours per week are devoted to meeting and instructing his classes in lecture-room, laboratory or shop; so many hours are needed for preparation for this work; so many hours are consumed in correcting and grading papers and handing in reports; so many hours are required in attendance on Faculty and Committee meetings; and there should be some time to give to advanced study and reading if the teacher is to keep intellectually alive. This schedule makes no provision for research, for exercise and recreation, or for domestic affairs. If the instructors are devoting maximum time and energy to their work with a given number of students, and the number of students is doubled with no increase in the teaching force, the necessary result must be that the quality of the instruction will be reduced by half. An institution faced with a large increase in attendance must do one of three things: (1) Accept the additional students, increase its teaching force in proportion, and maintain its standard of efficiency; or (2) limit its number of students to its present capacity, keep its present teaching force, and thus retain its standard; or (3) accept the added students make no provision for additional teachers, and lower its standard of instruction. The first of these alternatives is what all school authorities desire. The second is honest, but distressing to those who desire to see an institution grow in usefulness. The third is dishonest and in the end will prove disastrous.

A glance at comparative statistics will show that the Faculty of our University has from the beginning been overburdened with hours of work, unjust both to the teacher and the student. A glance at the statistics for our own school will show that this condition has grown progressively worse, that additions to the teaching staff have not kept pace with the growth in attendance. We have tried to compromise with the three alternatives; adding a fearfully inadequate number to the teaching force, limiting our attendance somewhat, and perforce submitting to a deterioration of our standards of efficiency—all in hopes that conditions would change for the better. The situation is now desperate. The State must either provide an adequate teaching force for the number of students demanding admission, or the officers of the University must drastically limit the attendance. This latter step will deprive numbers of young men who should receive their training here of this opportunity.

II, a—CURRENT EXPENSES.

The statement of the financial needs on the side of physical equipment requires less expansion, as they are very analogous to the situation faced by every family. If the head of a family of five persons finds his family increased to ten, the wants of the individuals remaining constant, and if his dollar can now purchase only half what it formerly did, then it is clear that his expenses will increase fourfold when these two changes occur simultaneously. If, in addition, he had allowed his stocks run abnormally low in prior years, then this would mean still further expense. This is practically the condition that obtains at the University. The number of students has largely increased and the various commodities consumed daily in the running of the University vary directly as the number of students. At the same time the cost of such commodities has increased even more largely than those used by a family. In addition, the stocks of supplies for laboratories, Chemistry, Physics, Biology, etc.; for shops; and for libraries had already become very low. It is needless to say that no matter how able the instructor or industrious the student, the quality of instruction must be lowered if these things are not adequately provided.

In conclusion, let me urge that the detailed needs of the University for the next biennium as contained in the following reports and summarized in the appended budget have been worked out most laboriously by the President, the Administrative Council, and the Faculty and represent the minimum requirements of the institution if it is to face the next two years with any hope of giving adequate training to the large body of young men who are demanding admission. The University believes that it has justified its existence and that the vast majority of the citizens of the State desire to see it supported. The future of Florida, its continued growth in population, in wealth, and in ideals of citizenship, is inextricably intertwined with the welfare of her University, and no more disastrous blow could be dealt the State than to cripple the usefulness of her great institution.

The following reports from the Deans and other officers will come in the order enumerated:

1. Report on Attendance, by the Registrar.
2. College of Arts and Sciences, James N. Anderson, Ph.D., Dean.
3. College of Agriculture, including the Experiment Station, and the Division of Agricultural Extension and Home Demonstration Work, P. H. Rolfs, M. A., Dean.
4. College of Engineering, J. R. Benton, Ph.D., Dean.
5. College of Law, Harry R. Trusler, A. M., LL.B., Dean.
6. Teachers' College and Normal School, H. W. Cox, Ph.D., Dean.
7. General Extension Division, B. C. Riley, B. A., B. S. A., Director.
8. General University Library, James M. Leake, Ph.D., Chairman of the Faculty Committee on University Library.
9. State Museum, T. Van Hyning, Curator.
10. Report of the University Auditor.

I conclude this report by submitting the following Biennial Budget for the University for the years beginning July 1, 1921, and ending June 30, 1923.

Respectfully submitted,

A. A. MURPHREE,
President.

RECAPITULATION.

ANNUAL BUDGET OF UNIVERSITY OF FLORIDA.

	Salary	Current Expenses	Permanent Improvements (Not Including Bldgs.)	Total	**Deductions	State Appropriation
General University..	$ 33,850	$ 27,335	$ 16,250	$ 77,435	$	$ 77,435
College of Arts and Sciences	48,700	6,750	9,025	64,475	9,500	54,975
College of Agriculture						
(1) Instructional	44,450	17,825	29,550	91,825	16,000	75,825
(2) Experiment Station	84,300	79,745	34,625	198,670	30,000	168,670
				290,495		
(3) *Demonstration Work						
College of Engineeri'g	29,600	1,170	25,000	55,770	10,500	45,270
College of Law......	19,300	400	3,800	23,500	4,000	19,500
Teachers' College....	43,300	2,600	3,400	49,300	8,000	41,300
Total	$305,500	$135,825	$121,650	$560,975	$ 78,000	$482,975
Total appropriation for two years..........................						$965,950

Buildings:

(1) Unit of Administration Building, Assembly Room, Library and State Museum	$ 150,000
(2) Dormitory and Equipment	100,000
(3) Enlargement of Dining Hall and Kitchen.................	40,000
(4) Extension of Central Heating Plant.....................	40,000
Grand Total	$1,295,950

*Smith-Lever Fund, County Agents and Home Demonstration Agents Co-operating with Woman's College and various counties.

**Morrill and Nelson Federal Fund	$ 25,000
Agricultural College Fund	7,790
Seminary Interest Fund	2,064
Smith-Hughes Federal Vocational Fund	5,000
Hatch and Adams Federal Experiment Station Funds	30,000
Law Tuition and Incidental Fund	5,146
General Education Board for Secondary Education	3,000
	$ 78,000

Addenda:

To Match Federal Aid for Farm and Home Demonstration Work	$ 83,500
For General University Extension Department	60,000
For Student Hospital Building	40,000

SUMMARY GENERAL UNIVERSITY EXPENDITURES.

	Salary	Current Expens's	Permt. Improv.	Total
Executive	$ 7,000	$ ......*	$	$ 7,000
Departments of Instruction	9,800	600	2,500	12,900
Library	4,300	2,750	3,750	10,800
Museum	1,800	1,000	10,000	12,800
Registrar's Office	2,700	.......*	....	2,700
Auditor's Office	4,300	22,985	....	27,285
Grounds and Buildings	3,950	.......*	....	3,950
Total	$ 33,850	$ 27,335	$ 16,250	$ 77,435

*Items carried under Auditor's Budget for Current Expense.

DETAIL BUDGET OF GENERAL UNIVERSITY EXPENDITURES.

I. Executive.

Salary—			
(1) President	$5,000		
(2) Vice-President	500		
(3) Secretary to President	1,500	$7,000	
Current Expense	*	......	
			$7,000

II. Departments of Instruction.

(1) Physical Education.

Salary—

Professor of Physical Education	$3,000

Current Expense—			
Maintenance of gymnasium	600		
Permanent Improvement—			
Apparatus for gymnasium	2,500	$6,100	
(2) Military Science.			
Salary—			
Commandant and Prof. of Mil. Science (Detailed by gov't).			
(3) Cadet Band.			
Salary—			
Instructor in Music	$2,500		
(4) Public Speaking.			
Salary—			
Assistant Prof. of Public Speaking......	$2,500		
(5) Y. M. C. A.			
Salary—			
Instructor in Bible and Secretary......	$1,800	$6,800	
	——	——	$12,900
III. Library.			
Salary—			
(1) Librarian	$2,500		
(2) Assistant Librarian	1,800	$4,300	
Current Expense—			
Subcriptions to magazines, rebinding and binding, additional assistance, office supplies....		$2,750	
	——	——	
Permanent Improvement—			
Purchase of new books	$3,750	$3,750	
	——	——	$10,800
IV. State Museum.			
Salary—			
Curator of Museum		$1,800	
Current Expense		$1,000	
Permanent Improvement—			
New cases and other needed equipment..		$10,000	
	——	——	12,800
V. Registrar's Office.			
Salary—			
(1) Registrar	$1,800		
(2) Stenographer and assistant to Registrar..	900	$2,700	
Current Expense—			
Office supplies ....*	.....	......	
	——	——	2,700

VI. Auditor's Office.			
Salary—			
(1) Auditor	$2,500		
(2) Bookkeeper	1,800	$4,300	
Current Expense—			
See auditor's budget for details*		$22,985	
			27,285
VII. Grounds and Buildings—			
Salary—			
(1) Superintendent of grounds and buildings	$2,000		
(2) Night watchman	1,200		
(3) Three student assistants at $250	750	$3,950	
Current Expense—(See Auditor's budget)...*		......	3,950
Total			$77,435

---

*Stationery, office supplies, etc., carried in Auditor's Budget.

AUDITOR'S BUDGET OF GENERAL CURRENT EXPENSES FOR THE ENTIRE UNIVERSITY OF FLORIDA.

Sundry supplies, including feed for campus mule teams, disinfectants, and toilet paper for buildings, etc.	$ 760.00
Heat, light and power, including gas and electricity for class rooms, laboratories and shops; coal and wood for central heating plant and other boilers	3,875.00
Postage and stationery for offices and departments	1,800.00
Printing and advertising, including catalog and three quarterly bulletins, special printing for registrar's office and miscellaneous advertising	4,200.00
Commencement expenses, including speakers, diplomas and medals for graduates; invitations and programs for exercises	1,000.00
Traveling expenses for all purposes	1,000.00
Miscellaneous expenses for association membership dues, premiums on bonds, freight and express	350.00
Janitor labor for instructional buildings, 5 janitors at $600 per annum	3,000.00
Campus labor for upkeep of grounds, walks and roads and planting of grass and shrubbery	4,000.00
Repairs and upkeep on all buildings, including painting, renewal of plumbing, labor on roofs and valleys, replace broken tile, etc.	3,000.00
Total for one year	$22,985.00

SUMMARY OF BUDGET FOR COLLEGE OF ARTS AND SCIENCES.

	Salary	Current Expens's	Permt. Improv.	Total
General	$ 500	....	....	$ 500
Ancient Languages	4,750	....	....	4,750
Biology	8.550	$ 1,000	$ 2,000	11,550
Chemistry	7,000	5,000	6,400	18,400
Economics and Sociology	3,000	....	....	3,000
English	8,550	....	....	8,550
History and Political Science	3,300	....	....	3,300
Mathematics	5,300	....	125	5,425
Modern Languages	4,750	....	....	4,750
Physics	3,000	750	500	4,250
Total	$ 48,700	$ 6,750	$ 9,025	$ 64,475

DETAIL BUDGET FOR COLLEGE OF ARTS AND SCIENCES.

I. General.			
Salary—			
Dean	$ 500		$ 500
II. Ancient Languages.			
Salary—			
(1) Prof. of Ancient Languages	$3,500		
(2) Ass't Prof. of Foreign Languages (one-half time)	1,250	$4,750	$4,750
III. Biology.			
Salary—			
(1) Professor of Biology	$3,500		
(2) Associate Professor of Biology	3,000		
(3) Instructor in Biology	1,800		
(4) Student Assistant	250	$8,550	
Current Expenses—			
Chemicals, dissecting materials, glassware, etc.		$1,000	
Permanent Improvements—			
Microscopes, charts, models, sterilizing apparatus, etc.		2,000	$11,550
Carried forward			$16,800

IV. Chemistry.

Salary—			
(1) Professor of Chemistry	$3,500		
(2) Instructor in Chemistry	1,800		
(3) Curator of Chemical Laboratories	1,200		
(4) Two Student assistants	500	$7,000	
Current Expenses (See Chemistry Budget)		$5,000	
Permanent Improvement (See Chemistry Budget)		6,400	$18,400

V. Economics and Sociology.

Salary—			
Professor of Economics and Sociology	$3,000		$3,000

VI. English.

Salary—			
(1) Professor of English	$3,500		
(2) Associate Professor of Englisa	3,000		
(3) Instructor in English	1,800		
(4) Student Assistant	250	$8,550	$8,550

VII. History and Political Science.

Salary—			
Professor of History and Political Science	$3,300		$3,300

VIII. Mathematics.

Salary—			
(1) Professor of Mathmetics	$3,500		
(2) Instructor in Mathematics	1,800	$5,300	
Permanent Improvement		$125	$5,425

IX. Modern Languages.

Salary—			
(1) Professor of Modern Languages	$3,500		
(2) Ass't Professor of Foreign Languages (one-half time)	1,250	$4,750	$4,750

X. Physics.

Salary—			
Associate Professor of Physics	$3,000	$3,000	
Current Expenses (See Dept. Report)*		750	
Permanent Improvement (See Dept. Report)*		500	$4,250
Total			$64,475
Deduct			16,000
Total annual appropriation			$48,475

CHEMISTRY BUDGET.

Class.	Chemicals	General Apparatus	Individual Apparatus
Freshman	$2,200	$ 400	$ 900
Organic	1,200	500	800
Gravimetric, Volumetric, Industrial	500	1,100	300
Physical	300	1,200	200
Agricultural, Physiological	800	500	500
Totals	$5,000	$3,700	$2,700

Of the general appartus needed the following may be mentioned:

Balances, analytical
Charts
Electric oven
Electric furnace
Electric vacuum and pressure pump
Platinum dishes
Chemical balances (freshman)
Babcock milk tester
Chemical microscope
Autoclave
Drying ovens
Combined baloptican
Galvanometer
Cooper-Hewitt light
Spectroscope and accessories
Solution balance

The individual apparatus includes test tubes, crucibles, evaporating dishes, Bunsen burners, retorts, etc., for separate experiments.

---

*Items carried under Audtor's Budget for Current Expenses.

SUMMARY OF BUDGET FOR AGRICULTURAL COLLEGE.
INSTRUCTIONAL (College Proper).

	Salary	Current Expens's	Permt. Improv.	Total
General	$ 2,600	$ 1,650	$ 4,150	$ 8,400
Horticulture	8,750	4,500	750	14,000
Animal Husbandry	7,750	3,850	16,400	28,000
Field Crops, Soils & Farm Engi.	15,350	4,375	3,000	22,725
Veterinary Science	3,750	1,100	1,250	6,100
Poultry Husbandry	3,750	2,350	4,000	10,100
Agricultural Chemistry	2,500	....	....	2,500
Total	$ 44,450	$ 17,825	$ 29,550	$ 91,825
Less Government Funds				$16,000
Total Annual Appropriation				$75,825

EXPERIMENTAL AND FIELD WORK.
(Agricultural Experiment Station).

	Salary	Current Expens's	Permt. Improv.	Total
General	$ 3,000	$ 14,200	$	$ 17,200
Mailing and Bulletin Room	1,000	750	....	1,750
Animal Industry	26,300	20,145	23,700	70,145
Sugar Cane	4,500	5,500	....	10,000
Soils and Fertilizers	10,500	7,000	....	17,500
Pecan Investigations	3,700	2,800	1,000	7,500
Plant Pathology	21,700	15,000	....	36,700
Entomology	8,400	6,550	....	14,950
Experiment Test Grounds	1,200	1,875	500	3,575
Experiment Station Library	2,000	575	1,125	3,700
Branch Experiment Station, Lake Alfred	2,000	5,350	8,300	15,650
Total	$ 84,300	$ 79,745	$ 34,625	$198,670
Less Government Funds	$ 17,200	$ 12,300	$ 500	$ 30,000
Total Annual Appropriation	$ 67,100	$ 67,445	$ 34,125	$168,670

Full explanations and details of the above figures will be found in Director Rolf's Report on pages as follows:

AGRICULTURAL COLLEGE.

General 80
Horticulture 81
Animal Husbandry 82
Field Crops, Soils and Farm Engineering 83
Veterinary Science 84
Poultry Husbandry 85
Agricultural Chemistry 85

EXPERIMENT STATION.

General 86
Mailing and Bulletin Room 87
Animal Husbandry 87
Sugar Cane 91
Soils and Fertilizers 91
Pecan Investigation 92
Plant Pathology 93
Entomology 94
Experiment Test Grounds 96
Experiment Station Library 96
Branch Experiment Station (Lake Alfred) 97

SUMMARY BUDGET FOR COLLEGE OF ENGINEERING.

	Salary	Current Expens's	Permt. Improv.	Total
General	$ 1,250	$ 70	$ 2,500	$ 3,820
Civil Engineering	6,250	225	5,000	11,475
Electrical Engineering	6,250	225	....	6,475
Mechanical Engineering	12,850	650	17,500	$ 31,000
Chemical Engineering	3,000	....	....	3,000
Total	$ 29,600	$ 1,170	$ 25,000	$ 55,770

DETAILED BUDGET FOR COLLEGE OF ENGINEERING.

I. General.			
Salary—			
(1) Dean	$ 500		
(2) Stenographer	750	$1,250	
Current Expense—			
Office supplies		$ 70	
Permanent Improvement—			
Apparatus (to be distributed to depts.)*		2,500	$3,820
II. Civil Engineering.			
Salary—			
(1) Professor of Civil Engineering	$3,500		
(2) Assistant Prof. of Civil Engineering	2,500		
(3) Student assistant	250	$6,250	
Current Expense—			
Maintenance of laboratory and instruments		$ 225	
Permanent Improvement—			
Equipment of hydraulic laboratory*		5,000	$11,475
III. Electrical Engineering.			
Salary—			
(1) Professor of Physics and Electrical Eng.	$3,500		
(2) Assistant Professor of Electrical Eng.	2,500		
(3) Student assistant	250	$6,250	
Current Expense—			
Maintenance of laboratory		$ 225	$6,475
IV. Mechanical Engineering.			
Salary—			
(1) Professor of Mechanical Engineering	$3,500		
(2) Associate Professor of Mechanic Arts	3,000		
(3) Assistant Professor of Mechanical Eng.	2,500		
(4) Instructor in Mechanic Arts	1,800		
(5) Instructor in Drawing	1,800		
(6) Student assistant	250	$12,850	
Current Expense—			
Maintenance of shops		$ 650	
Permanent Improvement—			
(1) Equipment of wood-shop*	$7,500		
(2) Equipment of forge*	2,500		
(3) Equipment of foundry*	2,500		
(4) Equipment of steam laboratory*	5,000	$17,500	$31,000

---

*To replace worn-out apparatus; for additional machinery and equipment for new shops erected three years ago but not used for lack of funds for apparatus and supplies.

V. Chemical Engineering.

Salary—

Associate Professor of Chemical Engineering	$3,000	$3,000

For Current Expenses and Permanent Improvements see budget for Chemistry under College of Arts and Sciences.

Total	$55,770
Deduct	10,500
Total annual appropriation	$45,270

SUMMARY BUDGET OF COLLEGE OF LAW.

	Salary	Current Expens's	Permt. Improv.	Total
General	$ 500	$200	$ 300	$ 1,000
Faculty	17,000	....	....	17,000
Library	1,800	200	3,500	5,500
Total	$19,300	$400	$3,800	$23,500

DETAIL BUDGET FOR COLLEGE OF LAW.

I. General.

Salary—

Dean	$ 500	
Current Expense—		
Office supplies	200	
Permanent Improvement—		
Office fixtures	300	$1,000

II. Faculty.

Salary—

(1) Professor of Law	$3,500	
(2) Professor of Law	3,500	
(3) Professor of Law	3,500	
(4) Professor of Law	3,500	
(5) Professor of Law	3,000	$17,000

III. Law Library.

Salary—		
Librarian and stenographer	$1,800	
Current Expense—		
Current law reports	200	
Permanent Improvement—		
Purchase new law books	3,500	$5,500
Total		$23,500
Deduct		4,000
Total annual appropriation		$19,500

SUMMARY BUDGET OF TEACHERS' COLLEGE.

	Salary	Current Expens's	Permt. Improv.	Total
General	$ 2,300	$2,100	$1,500	$ 5,900
Psychology	4,000	....	400	4,400
College Education	7,000	....	....	7,000
Elementary Education	3,500	....	....	3,500
Secondary Education	3,000	....	....	3,000
Agricultural Education	10,000	....	....	10,000
Nomal School and Practice High School	3,500	500	1,500	5,500
Summer School	10,000	....	....	10,000
Total	$43,300	$2,600	$3,400	$49,300

DETAIL BUDGET FOR TEACHERS' COLLEGE.

I. General.

Salary—			
(1) Dean	$ 500		
(2) Secretary to Dean	1,800	$2,300	
Current Expenses—			
(1) Office supplies	$ 900		
(2) Traveling expenses	1,200	$2,100	
Permanent Improvement—			
Desks and completion of Peabody Hall		$1,500	$5,900

II. Psychology.			
Salary—			
(1) Professor of Psychology	$3,500		
(2) Student Assistant in Psychology	250		
(3) Student Assistant in Educational Psy.	250	$4,000	
Permanent Improvement—			
Apparatus in Psychology Laboratory		400	$4,400
III. History, Theory and Arts of Education.			
Salary—			
(1) Professor of Education	$3,500		
(2) Professor of Education	3,500		$7,000
IV. Elementary Education.			
Salary—			
Professor of Elementary Education			$3,500
V. Secondary Education.			
Salary—			
Professor of Secondary Education			$3,000
VI. Agricultural Education.			
Salary—			
(1) Professor of Agricultural Education	$3,500		
(2) Professor of Industrial Education	3,500		
(3) Professor of Agricultural Education in Industrial Arts	3,000		$10,000
VII. Normal School.			
Salary—			
(1) Instructor in Languages	$2,500		
(2) Four teaching fellows	1,000	$3,500	
Current Expense—			
Maintenance of Practice High School Lab.		$ .00	
Permanent Improvement—			
Apparatus for Practice H. S. Laboratory		1,500	$5,500
VIII. Teachers Summer School.			
Salary—(See Summer School Bulletin)			$10,000
Total			$49,300
Deduct			8,000
Total annual appropriation			$41,300

Gainesville, Fla., February 12, 1921.

To the Honorable Board of Control,
Key West, Florida.

Gentlemen:

For a number of years the State Association of Druggists has recommended and urged that the University of Florida establish, in connection with its organized Department of Chemistry, a school in which the young men of the State may be taught practical pharmacy. We believe that such a department can be added with but little additional cost to the State.

We also believe that there is a widespread demand for instruction of this character at the State University. The pharmacists insist that the State ought to provide for a large contingent of young men who are at present forced to leave the State to attend other institutions at a cost of from three to four times the expense of attending such an institution at the University.

I beg, therefore, to submit herewith a careful estimate of the cost of such a department, and commend to your favorable attention the enclosed report of Dr. T. R. Leigh, the present head of the Department of Chemistry of the University of Florida. I further request at this statement, together with Dr. Leigh's report, be printed in the biennial report of the Board of Control, with such comment as the Board may see fit to make.

Respectfully submitted,
A. A. MURPHREE,
President.

February 7, 1921.

President A. A. Murphree,
University of Florida.

Sir:

Pursuant to our conference relative to the establishment of the College of Pharmacy at the University of Florida, wherein you instructed me to study the problem and render a report, I beg leave to submit the following:

There is no school of pharmacy within the State of Florida at the present time. The law requires that every pharmacy, or retail store carrying drugs, shall be under the direct supervision of a registered pharmacist, who shall take charge of the dispensing, of the compounding, and the sale of drugs, medicines or poisons anywhere in the State; and no licentiate shall have supervision of more than one pharmacy or drug store at one time. The immediate and continued employment of a large number of registered pharmacists is, therefore, required.

The State Pharmaceutical Asociation, representing a large and progressive membership, has for several years keenly felt the need of a college of pharmacy supported by State appropriation, in which young men might be thoroughly prepared for the profession. The State Association has, moreover, directed its efforts toward the establishment of such an institution, because at the present time the youth of Florida who desire to pursue a college course in pharmacy find it necessary to seek their instruction outside of the State.

For these and other reasons I recommend the establishment of the College of Pharmacy as the sixth college of the University of Florida, making it of equal rank and standing with the five existing colleges. The college of pharmacy that would best serve the citizens of Florida should offer the following courses of instruction:

I. A two year's course, leading to a certificate in pharmacy, which when combined with two year's experience in the practice of pharmacy, would render a person eligible as an applicant for the examination before the Board of Pharmacy of the State of Florida.

II. A three year's course leading to the title of Pharmaceutical Chemist (Ph. C.), which prepares persons for positions in wholesale drug and compounding companies.

III. A four year's course leading to a regular B. S. Degree in Pharmacy, which in some institutions is called Doctor of Pharmacy.

It is possible to establish the College of Pharmacy at the University of Florida by the expenditure of a small amount of money in the first few years of its existence owing to the fact that any of the branches of study required for the training of pharmacists are at the present time offered by the various departments of the University.

Six thousand dollars per year for the first two years will establish and maintain the College of Pharmacy, making twelve thousand dollars for the biennium. The following estimate has been made:

Dean	$ 500
Secretary to the Dean	300
Professor of Pharmacy	3,000
Special Lecturers	500
Laboratory Desks	400
Apparatus	450
Chemicals and Drugs	600
Library	150
Office Supplies, etc.	100
Amount of Annual Appropriation	$ 6,000

Respectfully yours,

TOWNES R. LEIGH.

Gainesville, Fla.

President A. A. Murphree,
University of Florida.

Sir:

I respectfully hand you herewith report showing the attendance at the University of Florida for the two sessions of the past biennium:

SUMMARY, 1918-1919.

Graduate School		5
College of Arts and Sciences		160
College of Agriculture—		
College	75	
Two-Year Course	12	
One-Year	1	
		88
College of Engineering		146
College of Law		62
Teachers' College and Normal School—		
College	11	
Normal School	23	
Practice High School	30	
Summer School	434	
		498
Advanced S. A. T. C. Course		25
Naval Reserves		22
Total Enrollment for 1918-1919		1,006
Counted Twice		18
Net Total		988
Number Attending Boys' Short Course in Agriculture		81
Number Attending Farmers' Ten-Day Short Course		87
Number Attending Army Training School		670
Grand Total		1,826

In 1918-1919, fifty-one Florida counties were represented as follows: Alachua, 146; Bay, 8; Bradford, 18; Brevard, 14; Broward, 3; Calhoun, 1; Citrus, 11; Clay, 1; Columbia, 15; Dade, 32; DeSoto, 42; Duval, 47; Escambia, 17; Flagler, 3; Franklin, 3; Gadsden, 3; Hamilton, 7; Hernando, 13; Hillsborough, 91; Holmes, 4; Jackson, 15; Jefferson, 4; Lafayette, 1; Lake, 37; Lee, 15; Leon, 18; Levy, 15; Liberty, 1; Madison, 9; Manatee, 17; Marion, 21; Monroe, 17; Nassau, 6; Okaloosa, 3; Orange, 23; Osceola, 12; Palm Beach, 29; Pasco, 14; Pinellas, 38; Polk, 28; Putnam, 9; St.

Johns, 12; St. Lucie, 4; Santa Rosa, 5; Seminole, 11; Sumter, 16; Suwannee, 17; Taylor, 1; Volusia, 17; Walton, 10; Washington, 1.

The District of Columbia, twenty-one States and six foreign countries were represented by 988 students, as follows: Alabama, 6; Arkansas, 2; Brazil, 6; Canada, 1; China, 2; Cuba, 1; Delaware, 1; District of Columbia, 1; Florida, 915; Georgia, 12; Illinois, 1; Indiana, 2; Iowa, 1; Japan, 1; Kentucky, 1; Mexico, 1; Michigan, 2; Mississippi, 4; Montana, 2; New York, 4; North Carolina, 2; Ohio, 3; Pennsylvania, 4; Philippines, 1; South Carolina, 6; South Dakota, 1; Tennessee, 3; West Virginia, 2.

In the fall of 1918 the entire equipment of the University of Florida was placed at the disposal of the United States Government, and all eligible students were inducted in the Student Army Training Corps the first of October. The registration and attendance from September 16th to October 10th was as follows:

Regular College Students Not Eligible for Student Army Training Corps	65	
Short Course Agriculture Students Not Eligible for Student Army Training Corps	19	
Practice High School Students Not Eligible for Student Army Training Corps	28	
Total Not Eligible for Student Army Training Corps		112
Students Registered for Induction, Student Army Training Corps		315
Naval Reserves Transferred to University of Florida		10
Total Registration		437
Number Withdrawn During the Month		15
Attendance at End of Month		422

The regular monthly report at the first of November showed that the registration had increased from 437 to 467; but as 30 students had withdrawn and 32 had been transferred to training camps, the attendance at that time was 405. From November 1st to December 14th the total registration was increased to 474, but on account of unsettled conditions the attendance was decreased to 296. On December 14th the S. A. T. C. was demobilized, and the University was closed until January 6th, 1919, when it re-opened on the old basis. As a great many students who had been members of the S. A. T. C. were financially unable to return to the University, and as many former students who had been in United States service elsewhere did return, the personnel of the student body in the spring was almost entirely different from what it had been in the fall. It became necessary to reorganize and reclassify the entire student body, and the first monthly report of that period showed a registration of 329 and an attendance at the end of the month of only 290. By the end of the session, June

3, 1919, the total registration for the reorganization had increased to 375, and the number in attendance at that time was 314. The summary given for 1918-1919 shows the total registration for the fall, spring and summer sessions, and indicates the number counted twice.

On June 3, 1919, at the end of the regular session, the following degrees were awarded: Honorary, LL.D., 3; M. S. in Agriculture, 1; M. A., 1; A. B., 3; B. S., 2; B. S. in Agriculture, 6; B. S. C. E., 1; B. S. E. E., 2; B. S. M. E., 1; M. E., 1; B. A. in Education, 2; LL.B., 2; and Certificate, Graduate in Farming, 1. On August 8, 1919, at the end of the summer session the following degrees and certificates were awarded: M. A. in Education, 1; A. B. in Ed., 1; B. S. in Agr., 1; B. S. E. E., 1; normal school certificates, 5.

SUMMARY, 1919-1920.

Graduate School		3
College of Arts and Sciences		179
College of Agriculture—		
College	129	
Two-Year Course	26	
One-Year Course	32	
Four-Months' Course	8	
		195
College of Engineering		150
College of Law		94
Teachers' College and Normal School—		
College	28	
Normal School	31	
Practice High School	13	
Summer School	612	
		684
Total Enrollment for 1919-1920		1,305
Counted Twice		29
Net Total		1,276
Number Attending Boys' Short Course in Agriculture		101
Number Attending Farmers' Ten-Day Short Course		55
Grand Total		1,432

In 1919-1920, fifty-four Florida counties were represented, as follows: Alachua, 180; Baker, 1; Bay, 10; Bradford, 38; Brevard, 13; Broward, 4; Calhoun, 4; Citrus, 14; Clay, 7; Columbia, 25; Dade, 40; DeSoto, 55; Duval, 63; Escambia, 27; Flagler, 6; Franklin, 3; Gadsden, 12; Hamilton, 8; Hernando, 2; Hillsborough, 128; Holmes, 6; Jackson, 13; Jefferson, 7; Lafayette, 8; Lake, 30; Lee, 24; Leon, 11; Levy, 14; Liberty, 2; Madison, 9; Manatee, 22; Marion, 35; Monroe, 19; Nassau, 1; Okaloosa, 11; Okeechobee, 4; Orange, 25; Osceola, 11; Palm Beach, 24; Pasco, 20; Pinellas, 46; Polk, 62; Putnam, 18; St. Johns, 14; St. Lucie, 12; Santa Rosa, 9; Seminole, 12; Sumter, 28; Suwannee, 22; Taylor, 2; Volusia, 18; Wakulla, 2; Walton, 7; Washington, 10.

The District of Columbia, twenty-one States and four foreign countries, were represented by 1,276 students, as follows: Alabama, 7; Brazil, 5; China, 2; Connecticut, 1; Delaware, 1; District of Columbia, 2; Florida, 1,198; Georgia, 14; Indiana, 1; Kentucky, 3; Maine, 2; Massachusetts, 1; Michigan, 4; Minnesota, 1; Mississippi, 2; Missouri, 2; New York, 4; North Carolina, 2; Ohio, 4; Pennsylvania, 5; Philippines, 1; Serbia, 2; South Carolina, 3; Tennessee, 7; Texas, 1; West Virginia, 1.

By a comparison of the total registration and attendance the first months of each semester and the last month of the regular session of 1919-1920, it will be seen that the registration steadily increased during the year, while the number in attendance varied. The first monthly report of the first semester, November 1, 1919, showed a total registration of 595, and the number in attendance, 583. The first monthly report of the second semester, March 1, 1920, showed a total registration of 656, and the number in attendance, 562. The final monthly report for the session showed a total registration of 672, and the number in attendance, 538. The summary for 1919-1920 includes the registration for the summer session and also the number attending the Boys' and Farmers' Short Courses.

On June 1, 1920, at the close of the regular session, the following degrees were awarded: A. B., 5; B. S., 5; B. S. in Agri., 15; B. S. C. E., 5; B. S. E. E., 6; B. S. M. E., 3; C. E., 1; J. D., 3;LL.B., 16; B. S. in Ed., 4; A. B. in Ed., 1; B. S. in Agr. Ed., 2, and normal school certificate, 1; certificate of Graduate in Farming, 3; certificate for two-year course in Agriculture, 1; certificate for one-year course in Agriculture, 6. On August 6, 1920, at the end of the summer session, the following degrees and certificates were awarded: M. A. in Ed., 1; B. S., 1; B. S. in Agr. Ed., 1; B. A. in Ed., 1; B. S. in Agr., 1; normal school certificates, 2.

Respectfully submitted,

W. B. ELLIS,

Registrar.

DEAN'S BIENNIAL REPORT, COLLEGE OF ARTS AND SCIENCES, UNIVERSITY OF FLORIDA.

To the President::

When I wrote my last biennial report two years ago we were engaged in a great war which was affecting our colleges in more ways than one, but most noticeably in the way of attendance. That year (1917-18) we had enrolled in the College of Arts and Sciences 92 men, but of this number 32, or more than one-third, had dropped out before the close of the year. The prospect for the fall term was not at all encouraging.

THE S. A. T. C.

At this critical juncture the National Government came to the assistance of the colleges, and the colleges came to the assistance of the Government. The S. A. T. C. was established and our colleges became mainly war institutions for the training of officers rather than educational centers for the training of citizens. This was a war measure and should be so judged. If the war had continued the S. A. T. C. would doubtless have justified itself. Even as it was, it may have had its influence in bringing about the sudden and unexpected cessation of hostilities. But judged from the point of view of the colleges, the experiment of the S. A. T. C. was not an entire success, though probably as successful here as at other institutions. Though not entirely successful the S. A. T. C. brought one great advantage. It held in college many men who would otherwise have dropped out. Our enrollment jumped from 92 in the College of Arts and Sciences to 160 in 1918-1919 and increased to 179 in 1919-1920. It would seem that the war has been a great incentive to our young men to seek a higher degree of education.

SALARIES.

I don't like to argue on a self-evident proposition but I wish to record my firm conviction that unless the salaries of the professors are greatly increased at once the usefulness of the University of Florida will be greatly impaired.

PERSONNEL OF THE FACULTY.

We have lost by death our beloved Professor of Mathematics, Dr. H. G. Keppel. This place was filled by the appointment of Dr. T. M. Simpson, of the University of Wisconsin.

Dr. N. L. Sims, Professor of Sociology and Political Science, left in the middle of this year. The place remained vacant the rest of the year, but Dr. L. M. Bristol has been appointed Professor of Economics and Sociology for next year.

Mr. O. C. Ault, Professor of History and Economics, was on leave of absence in 1918-1919, and when he failed to return Dr. J. M. Leake was appointed to that professorship.

Dr. J. L. McGhee, Professor of Chemistry, resigned this spring. He was succeeded by Dr. T. R. Leigh.

Mr. J. J. Grimm, Assistant Professor of Botany and Bacteriology, has gone away for further study. His place is taken by Mr. M. D. Cody.

Mr. E. C. Beck has been added to our faculty as Assistant Professor of English.

Changes have also taken place in the assistant professorship of chemistry and in the chair of philosophpy, but perhaps these changes will be recorded elsewhere.

Noteworthy is the fact that every man that has left the University has received a considerably larger salary in his new position. Most of these men we could have held if we could have paid them as much as they were offered elsewhere.

THE HOUSING PROBLEM.

It is very difficult at present to find quarters for our new professors. It would be of great advantage if we had houses we could turn over to them. It was a part of the original scheme in planning the university to build houses on the campus for the professors. Would it not be well to consider now whether or not it is advisable to carry out this plan?

LIBRARY.

Every department is vitally interested in the library. Without further mention it is understood that each professor expects a fair appropriation for books, periodicals, etc. We should make our library as good as possible and provide every facility possible for its efficient use.

TRAVELING EXPENSES.

There ought to be a fund to permit some of our professors to attend the annual meetings of the learned societies in which they might be most interested. This I recommend in the interests of the University—to keep our professors up to date in their several fields.

THE DEPARTMENTS OF THE COLLEGE.

ANCIENT LANGUAGES.

During the S. A. T. C. period no courses in Greek were given and only two courses in Latin. These classes consisted of non S. A. T. C. students. During this period the professor devoted the most of his time to teaching French, of which there were many classes. At the termination of the S. A. T. C., other courses in Latin and Greek were organized.

The classes in Latin and Greek are relatively not large, but there is considerable demand for courses which cannot be given on account of our limited teaching force. A number of our students every year call for elementary courses in Latin, which they neglected to take while they were in High School. It seems to me that we have arrived at a point where we shall have to give these courses regularly every year, but to do so we shall need some help. Perhaps half the time of an assistant professor of languages would meet our needs for the next biennium.

BIOLOGY.

The department of biology has recently been reorganized, the old department of botany being divided between the department of horticulture and the department of biology. This has given some temporary relief, but the department is still badly crowded. Last year there were enrolled in the department 132 students the first semester and 110 the second semester. The two laboratories used by the department were scarcely sufficient to meet the needs of these students. Professor Davis suggests that we need a new building especially designed for the work in biology. He suggests that the museum might well be located in this proposed new building.

He asks for an additional instructor in biology and for a student assistant.

The following is an itemized estimate by Dr. Davis of his needs for each of the next two years:

Instructor	$1,800.00
Student Assistant	250.00
Bacteriology and Plant Pathology	500.00
Botany	250.00
Zoology and Entomology	350.00
Microscopes for Botany, Bacteriology and Zoology	1,250.00
Aquaria	150.00
Charts, Models, Etc.	250.00
Boathouse, Collecting Apparatus, Etc., for Field work	250.00
Library	250.00
Total	$5,300.00

CHEMISTRY.

This department is almost overwhelmed by the large number of students. Something like 200 men are taking chemistry. The department needs more space, more laboratories, more chemicals, more instruments, more books, more teachers—better equipment in every respect. The professor thinks we need a new building devoted entirely to chemistry.

He suggests that we add to our staff an associate professor, an instructor, curator, five fellowships and a part-time stenographer.

He gives the following detailed estimate of his needs in material equipment for each of the next two years:

Physical Chemistry	$ 1,750.00
Organic Chemistry	1,500.00
Qualitative, Quantitative and Industrial Chemistry	3,000.00
General Inorganic (Freshman Chem.)	2,500.00
Physiological and Agricultural Chemistry	2,750.00
Library	1,250.00
Lantern Slides, Charts, etc.	125.00
Office Necessities	50.00
Total	$ 12,925.00

ECONOMICS AND SOCIOLOGY.

Dr. L. M. Bristol has recently arrived to take charge of this department. See Department of History and Economics.

ENGLISH.

We now require two years of English of every candidate for a degree in the College of Arts and Sciences. This means large numbers in English—and additional teachers must be provided. Professor Farr has been ably assisted by Assistant Professor Beck, but these two are no longer able to give all the desired courses in English. An additional instructor is asked for, as well as a student assistant.

HISTORY AND POLITICAL SCIENCE.

The work in the social sciences has been reorganized recently, and now consists of the Department of History and Political Science on the one hand and on the other the Department of Economics and Sociology. That is, Profesor Leake has exchanged Economics for Political Science. Ultimately we shall have to divide these two departments again and make four departments out of them. Even at present it is difficult for two men to give the desired courses in these two departments. Since History I is required of all A. B. Freshmen, the class is large and unwieldy and should be divided. Professor Leake, wao, pending the election of a Professor of Economics and Sociology, made a report for the two departments, thinks that the services of an assistant professor should be divided between the two departments.

There is still some demand for the establishment of a School of Business Administration. In the face of greater needs, this question may well be postponed, but should not be lost sight of. It was discussed in my last report.

MATHEMATICS.

Since some mathematics is required of all regular students in this college and many students in other colleges, we once more face the situation of having more students in the department than we can conveniently and properly take care of. The past year there were about 300 students in mathematics. The professor of mathematics could not handle all the classes. After resorting to temporary expedients an assistant professor of mathematics and physics was finally appointed, and this gave a partial and temporary relief. The professor now asks for an additional instructor in mathematics. There is also great need of good blackboards and other equipment.

MODERN LANGUAGES.

The modern language department is full to overflowing. The elementary classes have to be divided into two or three sections. The large amount of written work makes the giving of these courses particularly laborious. Some courses for which there was demand could not be given. The professor of ancient languages gave some assistance, but his services are needed in his own department. At least a half-time assistant professor is needed in this department.

PHYSICS.

This department also has been overwhelmed with large numbers. The past session there were about 240 students registered in physics. Our laboratory facilities were taxed and our teaching force inadequate. Finally an assistant professor of physics and mathematics was appointed, and this gave some relief, but more help is needed in order to give several advanced courses for which there is a demand.

The professor asks for an appropriation of $750 a year for upkeep and $500 a year for the purchase of new equipment.

I am subjoining a resume of the modest and moderate estimate of the needs of the College of Arts and Sciences for each of the next two years. Salaries are included, but estimates for the library are omitted.

BUDGET.

	Salary	Current Expens's	Permt. Improv.	Total
General	$ 500	$	$	$ 500
Ancient Languages	4,750	....	....	4,750
Biology	8,550	1,000	2,000	11,550
Chemistry	7,000	5,000	6,400	18,400
Economics and Sociology	3,000	....	....	3,000
English	8,550	....	....	8,550
History and Political Science	3,300	....	....	3,300
Mathematics	5,300	....	125	5,425
Modern Languages	4,750	....	....	4,750
Physics	3,000	750	500	4,250
Total	$ 48,700	$ 6,750	$ 9,025	$ 64,475

DETAIL BUDGET FOR COLLEGE OF ARTS AND SCIENCES.

I. General.			
Salary—			
Dean	$ 500		$ 500
II. Ancient Languages.			
Salary—			
(1) Professor of Ancient Languages	$3,500		
(2) Assistant Prof. of Foreign Languages (one-half time)	$1,250	$4,750	$4,750
III. Biology.			
Salary—			
(1) Professor of Biology	$3,500		
(2) Associate Professor of Biology	3,000		
(3) Instructor in Biology	1,800		
(4) Student Assistant	250	$8,550	
Current Expenses—			
Chemicals, Dissecting Materials, Glassware, etc.		$1,000	
Permanent Improvements—			
Microscopes, Charts, Models, Sterilizing Apparatus, etc.		2,000	$11,550
Carried forward			$16,800

IV. Chemistry.			
Salary—			
(1) Professor of Chemistry	$3,000		
(2) Instructor in Chemistry	1,800		
(3) Curator of Chemical Laboratories	1,200		
(4) Two Student Assistants	500	$7,000	
Current Expenses (See Chemistry Budget).		$5,000	
Permanent Improvement (See Chemistry Budget)		$6,400	$18,400
V. Economics and Sociology—			
Salary—			
Profesor of Economics and Sociology)	$3,000		
			$3,000
VI. English.			
Salary—			
(1) Professor of English	$3,500		
(2) Associate Professor of English	3,000		
(3) Instructor in English	1,800		
(4) Student Assistant	250	$8,550	$8,550
VII. History and Political Science.			
Salary—			
Professor of History and Political Science	$3,300		$3,300
VIII. Mathematics.			
Salary—			
(1) Professor of Mathematics	$3.500		
(2) Instructor in Mathematics	1,800	$5,300	
Permanent Improvement		$ 125	$5,425
IX. Modern Languages.			
Salary—			
(1) Professor of Modern Languages	$3,500		
(2) Ass't Prof. of Foreign Languages (one-time)	1,250	$4,750	$4,750

X. Physics.

Salary—			
Associate Professor of Physics	$3,000	$3,000	
Current Expenses (See Dept. Report)		750	
Permanent Improvement (See Dept. Report)		500	$4,250
Total			$64,475
Deduct			$16,000
Total Annual Appropriation			$48,475

CHEMISTRY BUDGET.

CLASS	Chemicals	General Apparatus	Individual Apparatus
Freshman	$2,200	$ 400	$ 900
Organic	1,200	500	800
Gravimetric Volumetric Industrial	500	1,100	300
Physical	300	1,200	200
Agricultural Physiological	800	500	500
Totals	$5,000	$3,700	$2,700

Of the general apparatus needed the following may be mentioned:

Balances, analytical
Charts
Electric oven
Electric furnace
Electric vacuum and pressure pump
Platinum dishes
Chemical balances (freshman)
Babcock milk tester

Chemical microscope
Autoclave
Drying ovens
Combined baloptican
Galvanometer
Cooper-Hewitt light
Spectroscope and accessories
Soluction balance

The individual apparatus includes test tubes, crucibles, evaporating dishes, Bunsen burners, retorts, etc., for separate experiments.

Respectfully submitted,

JAMES N. ANDERSON,
Dean of the College of Arts and Sciences.

DEAN'S BIENNIAL REPORT, COLLEGE OF AGRICULTURE, UNIVERSITY OF FLORIDA.

AGRICULTURAL COLLEGE BIENNIAL BUDGET.

Dr. A. A. Murphree, President.

Sir:— Herewith please find the budget setting forth the minimum needs of the Agricultural College for the biennium beginning July 1, 1921.

Respectfully yours,

P. H. ROLFS, Dean.

The summary of this budget is followed by a detailed statement of all the items in the summary and of the uses for which they are to be employed.

No appreciable enlargement of the equipment for the Florida Agricultural College has been made since 1914. At that time the dairy barn was completed. Since then the student body in the Agricultural College has increased over 100 per cent. This makes many of the classes so large that they have to be divided into sections. The class-room space, like the equipment, is also inadequate. The lack of sufficient class-rooms and equipment has made it exceedingly difficult for the professors to get maximum results from their teaching. The stress brought on as an incident to the war has now passed and we should therefore make up for the lost time. The need for men and material for war made it imperative for us to get along without the needed equipment and instructional force. In many of the departments the equipment is inferior to and the instructional force much smaller than that which maintains in other Southern States. This budget calls only for those things that are most imperatively needed. It must be somewhat larger than would have been the case, if during the last six years, a reasonable addition had been made each year.

SUMMARY OF BUDGET FOR AGRICULTURAL COLLEGE.

Instructional (College Proper).

	Salary	Current Expens's	Permt. Improv.	Total
General	$ 2,600	$ 1,650	$ 4,150	$ 8,400
Horticulture	8,750	4,500	750	14,000
Animal Husbandry	7,750	3,850	16,400	28,000
Field Crops, Soils & Farm Engi.	15,350	4,375	3,000	22,725
Veterinary Science	3,750	1,100	1,250	6,100
Poultry Husbandry	3,750	2,350	4,000	10,100
Agricultural Chemistry	2,500	....	....	2,500
Total	$44,450	$17,825	$29,550	$91,825
Less government funds				$16,000
Total annual appropriation				$75,825

EXPERIMENTAL AND FIELD WORK.

(Agricultural Experiment Station.)

	Salary	Current Expens's	Perm. Improv.	Total
General	$ 3,000	$14,200	....	$ 17,200
Mailing and Bulletin Room	1,000	750	....	1,750
Animal Industry	26,300	20,145	$23,700	70,145
Sugar Cane	4,500	5,500	....	10,000
Soils and Fertilizers	10,500	7,000	....	17,500
Pecan Investigations	3,700	2,800	1,000	7,500
Plant Pathology	21,700	15,000	....	36,700
Entomology	8,400	6,550	....	14,950
Experiment Test Grounds	1,200	1,875	500	3,575
Experiment Station Library	2,000	575	1,125	3,700
Branch Experiment Station, Lake Alfred	2,000	5,350	8,300	15,650
Total	$84,300	$79,745	$34,625	$198,670
Less Government Funds	17,200	12,300	500	30,000
Total Annual Appropriation	$67,100	$37,445	$34,125	$168,670

INSTRUCTIONAL DIVISION.

I. GENERAL.

Under this heading are included such items as are not correctly chargeable to any particular instructional department. The State has a number of small farm buildings here costing approximately $10,000. These being frame buildings, will require larger amounts for repairs and painting than more permanent structures. The people of the State are not willing to see their property neglected. The buildings must be kept in good repair, and the fences and roads must be kept up in good shape.

The people of the State have also a right to know what progress is being made. The most efficient way of informing a large number is through exhibits at county and State Fairs, and we ask for $750.00 for this purpose.

Salary—

(1) Dean*	$1,300	
(2) Stenographer to Assistant Dean	1,300	$2,600

Current Expenses—

(1) Printing and Publishing	$ 500	
(2) Exhibits at State and County Fairs	750	
(3) Office Supplies	400	$1,650

Permanent Improvements—			
(1) Completion of third floor of Agriculturall Hall	$3,250		
(2) Repair and Painting of Farm Buildings	750		
(3) Rebuilding Fences	150	$4,150	$8,400

*Salary as Dean of College	$1,300
Salary as Director of Experiment Station	1,200
Salary as Director of Extension Division	2,200
Full Salary	$4,700

II. HORTICULTURE.

Citrus growing is the most important line of agricultural work that is being carried on in the State. It brings in an annual revenue of about forty million dollars. To the present time it has not been possible to have more than part time of one man to give instruction to the students of citrus culture, though many of our people in the State devote an entire lifetime to this business. There is no other institution in the United States to which our young men can be sent to receive the proper training in this line.

Truck growing, peach growing, pecan growing, as well as other fruit crops, must be given greater attention than heretofore. The State is being seriously hindered in its development for the lack of young men with good fundamental training in these lines of horticulture. The instruction we are giving is as good as can be found anywhere, but the classes have grown entirely too large and too numerous. The scientific truths which should be taught in horticulture are too voluminous for one man to handle. Florida must produce her own horticulturists or else lose millions of dollars and be greatly retarded in her development.

Salary—			
(1) Professor of Horticulture and Assistant Dean	$3,500		
(2) Professor of Citri-Culture and Botany	3,000		
(3) Foreman for Horticultural Grounds	2,000		
(4) Student Assistant	250	$8,750	
Current Expenses—			
(1) Two Laborers at $600	$1,200		
(2) Class Supplies and Repairs	3,000		
(3) Traveling Expenses	300	$4,500	
Permanent Improvement—			
(1) Extension of Horticultural Grounds	$750	$750	$14,000

III. ANIMAL HUSBANDRY.

Live stock has made such rapid progress in the last six years that it is now holding a commanding position. Our equipment, which was fairly adequate six years ago, is entirely too small to accommodate the classes and too meager to satisfy the cattle raisers, hog raisers and sheep raisers of the State. Our best and most advanced students in animal husbandry have had to go to Illinois, Iowa, Wisconsin, Ohio, Georgia and other States to receive advanced instruction and the benefit of adequate laboratory equipment and type herds which are indispensible to education along animal husbandry lines. As no material addition has been possible in the last four years, it can be readily understood that the department today is entirely insufficiently equipped to satisfy the needs of the State. It is impossible at the present time for the instructors to give the students that are making application for this work the instruction that they deserve. Dairying is rapidly becoming an important agricultural work, but differs from this work as carried on in other States. Florida has had to rely almost entirely upon other States for her trained dairymen. At the present time we have at the college practically only those types of pure-bred animals that have been donated to the institution by interested friends. The State Agricultural College should have at least a pair of all the different types of beef and dairy cattle, as well as of hogs and sheep. Our equipment, both in the line of laboratory supplies and type animals, is far below that of any other of the Southern agricultural colleges. The amount asked for in the animal husbandry department is the minimum that can be effiicently used.

Salary—.

(1) Professor of Animal Husbandry	$3,500	
(2) Assistant Professor of Animal Husbandry	2,500	
(3) Herdsman and Foreman	1,500	
(4) Student Assistant	250	$7,750

Current Expenses—

(1) Two Laborers for Feed Crops at $600	$1,200	
(2) Office and Class	150	
(3) Purchase of Supplies for Class-room	200	
(4) Glassware and Chemicals	200	
(5) Traveling Expenses	300	
(6) Concentrates for Feeding Hogs, Cattle and Mules	1,800	$3,850

Permanent Improvements—

(1) Barn for Beef Cattle, Sheep and Forage	$4,000
(2) Three Shelter Sheds for Dairy Cattle and Calves	600

(3) Ceiling, Painting and Repairing Dairy Barn..	1,750		
Fencing, Feeding Troughs, Concrete Floors	300		
(5) Clearing Land for Pasture	750		
(6) Beef Cattle, Shorthorn, Hereford and Angus types	5,000		
(7) Swine, Types of Three Breeds	1,500		
(8) Sheep, Types of Three Breeds	600		
(9) Meat, Slaughter and Curing	500		
(10) Dairy Laboratory	1,000		
(11) Scales, Judging Pens	400	$16,400	$28,000

IV. FIELD CROPS, SOILS AND FARM MANAGEMENT.

The soils of Florida are extremely variable. They are at the same time among the most difficult to make and keep productive. Much is already known about the soils, and this should be imparted to the young men of the State. It is, therefore, necessary to enlarge our instructional force in this department. Closely allied to the soils studies is that of agricultural engineering. Proper laying out of drainage systems, proper construction of irrigation systems, proper handling of farm tractors, as well as knowledge of handling farm machinery, to say nothing about the proper choice of farm implements for particular farms, is of highest importance.

The correct management of a farm is as necessary as the correct management of a bank or of a merchandise establishment. Good farming is becoming so complicated that it is necessary to give special instruction so that the students may know which particular part of farming business is profitable and which is unprofitable. Formerly the farmer had no means of knowing the facts in regard to various crops. All that was known was that at the end of the year he had more or less money than the year before. Many crops are being grown on the farms that cannot be produced economically. Farm management discovers whether it is economical for the particular farm to produce certain crops or not.

Instruction in general farming or how to grow crops has always been a crying need in agriculture here as elsewhere. There is now a large fund of accurate and definite data on this subject. To make this available to the students in agriculture it is necessary to have an additional teacher and more equipment.

Salary—

(1) Professor of Agronomy	$3,500	
(2) Professor of Soils	3,000	
(3) Assistant Professor of Agronomy	2,500	
(4) Assistant Professor of Agricultural Engineering	2,500	
(5) Instructor in Farm Management	1,800	
(6) Instructor in Agronomy and Farm Foreman....	1,800	
(7) Student Assistant	250	$15,350

Current Expenses—

(a) Agronomy.			
(1) Machinery, Including Tractor	$ 750		
(2) Fertilizer, Seed, Etc.	600		
(b) Soils.			
(1) Scientific Apparatus	300		
(2) Laboratory Materials	250		
(c) Farm Crops.			
(1) Seed for Classes and Planting Demonstrations	200		
(d) Farm Management.			
(1) Laboratory Materials	250		
(2) Traveling Expenses and Field Work	1,500		
(e) Agricultural Engineering.			
(1) Supplies, Tools, Etc.	525	$4,375	

Permanent Improvements—

(a) Agronomy.			
(1) Clearing and Draining Lands	$ 500		
(2) Fencing and Road Building	250		
(b) Agricultural Engineering.			
(1) Tractors	1,500		
(2) Gas Egines	250		
(3) Other Machinery	500	$3,000	$22,725

V. VETERINARY SCIENCE.

When the Florida farmer, stockman or the Livestock Sanitary Board wishes to employ an experienced veterinarian they have to depend on some one trained in another State. There has been very little opportunity in this State for the investigation of contagious livestock diseases especially those that are peculiar to Florida. It is expected to make a beginning now and lay the foundation for the teaching of veterinary science on a larger scale. It is also proposed to make some investigations on certain swine diseases and other conditions that are peculiar to animals of our State. No class of work has been more appreciated than that done by our veterinary department, nor has any been more generally demanded.

Salary—

(1) Professor of Veterinary Science	$3,500	
(2) Student Assistant	250	$3,750

Current Expenses—

(1) Equipment of Contagious Disease Laboratory	$750	
(2) Equipment for Class Work	350	$1,100

Permanent Improvements—			
(1) Shed and Clinical Operating Room	900		
(2) Quarantine and Isolation Pens	350	$1,250	$6,100

VI. POULTRY HUSBANDRY.

A small beginning has been made in this direction, and with the investment of $5,000 annually for permanent improvement this department can be gradually worked up so as to be a credit to the State. The amount asked for is the least that is required. Nearly every farm home in the State will be benefitted by the improvement in poultry husbandry, and tarough instruction of farm boys in this subject.

Salary—			
(1) Professor of Poultry Husbandry	$3,500		
(2) Student Assistant	250	$3,750	
Current Expenses—			
(1) Investigation of Sore-Head Vaccine	$ 450		
(2) Feeds	500		
(3) Labor	1,000		
(4) Traveling Expenses	400	$2,350	
Permanent Improvements—			
(1) Houses, Yards and Runs	$1,500		
(2) Breeding Stock and Laying Contests	2,500	$4,000	$10,100

VII. AGRICULTURAL CHEMISTRY.

The whole realm of chemistry is so large that no one can learn all there is to be known of the subject. The agricultural students must have instruction in chemistry. This instruction in chemistry should be of an agricultural nature. The fundamentals of all chemistry are the same, but the agricultural application of chemistry should be taught to agricultural students. The classes in chemistry are so large that they have to be divided into sections. The agricultural students should be taught by a man especially fitted to teach agricultural chemistry.

Salary—			
(1) Assistant Professor of Chemistry	$2,500		$2,500
(For Laboratory Supplies and Equipment See Under College of Arts and Sciences.)			

Total for Instructional Purposes	$91,825
Less Government Funds	16,000
Total Annual State Appropriation for Instruction	$75,825

DETAILED BUDGET FOR THE EXPERIMENT STATION AND FIELD WORK.

Agricultural Experiment Station.

I. GENERAL.

In handling the work economically at the Experiment Station there is much that must be done in a general way that cannot readily be charged to any department, such as salary of the Director, salary of the Secretary, salary of the Auditor, also a considerable amount of current expenses, including the publication of the bulletins and annual reports. The demand for Experiment Station bulletins has become so great that it requires a very large edition of each number. It will no longer suffice to place these out in small editions. Of the 157 bulletins that have been published by the Experiment Station less than 25 per cent are in print. Many of the bulletins that are out of print are among the most valuable that have been issued from the institution. Owing to the fact that no fund was available during the present biennium for issuing out of print bulletins the cost of printing in the next two years will be somewhat greater than would otherwise be the case. The constant importunities for information on materials contained in bulletins out of print, show that the people of the State are needing this information and are wanting it. The printing of the bulletins is one of the most important pieces of work of the Experiment Station.

Salary—			
(1) Director	$1,200		
(2) Secretary	1,000		
(3 Assistant to Auditor	800	$3,000	

Current Expenses—			
(1) Traveling expenses. director	$ 125		
(2) Printing current bulletins	2,500		
(3) Emergency miscellaneous	1,400		
(4) Office supplies	200		
(5) Stamps, stationery and supplies	800		
(6) Files and furniture	400		
(7) Freight and express	150		
(8) Fuel for Experiment Station	400		
(9) Janitor's supplies	200		
(10) Janitor, Experiment Station	600		
(11) Painting Experiment Station	375		
(12) Repair of fencing	300		
(13) Printing and reprinting bulletins	6,000		
(14) Exhibits farm crops and livestock at State and county fairs	750	$14,200	$17,200

II. BULLETIN AND MAILING ROOM.

With the many thousands of names on the mailing list, the varied and large amount of material of this kind that has to be cared for and distributed, it is necessary to have this part of the work done by a careful and competent person.

Salary—		
(1) Clerk	$1,000	
Current Expenses—		
(1) Miscellaneous	750	$1,750

III. ANIMAL INDUSTRY AND FIELD CROPS.

General.—Experiments along the line of animal husbandry and field crops are among the most important bits of work that can be done. This should not be confused with the instructional work on this same subject. The field has grown so large and the livestock interests of the State so varied, that increasingly large demands are being placed on the Experiment Station for extending this work. There is only one Florida, consequently the Florida Experiment Station is practically the only one to which people can look for accurate and detailed information on problems peculiar to Florida.

Dairy.—The dairy experiments carried out in the last fifteen years have given such splendid results that the dairymen of the State are demanding more work of this kind. In addition to the work being carried on at headquarters, a man should be employed who is capable of going to all dairies in the State and carry out co-operative experiments with the dairymen. He should also be able to give them advice regarding the construction of dairy barns and the proper balancing of feeds. The services of such a man now would be invaluable to the State. Standard breeds of livestock must be added with which to perform these experiments at headquarters in dairy work. It can not be expected that each farmer perform such experiments for himself. It costs immeasurably less to have these investigations made at the Experiment Station and give all the dairymen the benefit of the results than to duplicate such experiments on each of the farms.

Swine.—Much fine work has already been done in swine husbandry. The amount that has been done points out the immensity of the field. As an illustration, according to the Southern Ruralist, Florida is being penalized five million dollars every year on account of producing soft pork. Apparently, from our studies of the soft pork question it will be possible, in time, to eliminate it entirely without materially increasing the cost. This is one of the very important lines of work that needs to be carried out. The Experiment Station must own type animals of different breeds for foundation stock. Without the possibility of breeding with known stock, much of the experimental work will be far less valuable.

Crops for Dairy and Swine.—The Experiment Station is a business proposition. It is necessary, therefore, to produce as much of the feed and forage for livestock on its own farm as possible. The State should not buy feed for its animals when this feed can be economically raised in our own fields.

Range Cattle Improvement.—By far the largest area in Florida is at present employed for production of range cattle. These animals are numbered by the hundreds of thousands. Experiments on the range are imperative. The cattle on the range must be greatly improved. A specialist should be employed who can devote all of his time to co-operating with the owners of range cattle and help them, either through the securing of pure-bred bulls, or by improvement of the feeding quality of the range. Experiments should be started immediately to test out the different breeds of beef cattle best adapted to varying conditions of the ranges as well as the grasses best adapted to the widely varying ranges.

Feeding Experiments.—The most advanced farmers in Florida are beginning to take up the question of steer feeding for high-priced markets and production of the finest types of beef. Older states have spent millions of dollars and lost many thousands of dollars for the lack of accurate and definite data in regard to the best methods of feeding and handling animals at the time of feeding. Much of the best fattening forage at the present time is utilized in Florida only for the improvement of the soil. Steer feeding should be systematized and brought into a profitable line of agriculture. With this in view, Florida has many crops peculiar to itself that need to be tested under our climatic conditions.

Field Crops.—The general field crops in Florida are of such vital importance to the State that it is necessary to carry out detailed and extensive work, not only at the Central Experiment Station but in various parts of the State, to determine the best methods of crop production. One boy in Florida has raised over one hundred bushels of corn annually for three consecutive years without using fertilizer. The average yield per acre for corn in Florida is from 14 to 16 bushels. There are many other standard field crops upon which experiments need to be performed, both at the station and with leading farmers.

Grasses and Forage.—Such splendid success has been attained by the small amount of work that we have done with the introduction and distribution of better pasture grasses and the development of pastures that these need only to be mentioned. Grasses are the foundation for the prosperity of the livestock farmer. Already a large number of our promising grasses have been introduced from foreign countries, and these await distribution to various parts of the State. It is necessary to establish these in permanent pastures, especially in north Florida.

(a) General.		
Salary—		
(1) Animal Industrialist and Vice Director	$4,000	
(2) Stenographer and Clerk	1,500	$5,500
Current Expenses—		
(1) Labor on Experiments	$1,000	
(2) Office Supplies and Stationery	900	$1,900
(b) Dairy—Experimental and Field Work.		
Salary—		
(1) Field Assistant Dairyman	$2,500	
(2) Dairy Foreman	1,200	$3,700
Current Expenses—		
(1) Labor	$ 900	
(2) Concentrates, Feeds	1,750	
(3) Traveling Expenses	1,500	$4,150
Permanent Improvement—		
(1) Purchase of Holstein, Jersey and Guernsey		5,000
(c) Swine—Experimental and Field Work.		
Salary—		
(1) Swine Husbandman	$3,000	
(2) Assistant in Swine Management	1,200	
(3) Chemical Assistant on Soft Pork and spe- dairy work	1,800	$6,000
Current Expenses—		
(1) Labor	$ 720	
(2) Feeds for Foundation Stock	$2,750	$3,470
Permanent Improvement—		
(1) Foundation Breeding Stock	$9,000	
(2) Stock for Feeding Experiments	1,750	
(3) Shelter Shed for Swine	500	
(d) Crops for Dairy and Swine.		
Salary—		
(1) Farm Foreman		1,800
Current Expenses—		
(1) Four Laborers at $600	$2,400	
(2) Occasional Labor	500	
(3) Fertilizer for 150 Acres Field Crops	1,200	4,100

Permanent Improvement—			
(1) Mules at $300	$ 600		
(2) Farm Machinery	500	$1,100	
(e) Beef.			
Range Cattle Improvement.			
Salary—			
(1) Range Cattle Specialist		$2,500	
Current Expenses—			
(1) Traveling Expenses		$1,500	
Permanent Improvement—			
(1) Purchase of Bulls		$1,000	
Feeding Experiments.			
Current Expenses—			
(1) Feed	$ 800		
(2) Labor for Feeding	175	$ 975	
Permanent Improvement—			
(1) Purchase of Steers at $40 (Revolving Fund)	$ 800		
(2) Ensilage Cutter	150		
(3) New Silos	900		
(4) Shelter Shed for Beef Cattle	500	$2,350	
(f) Field Crops.			
Salary—			
(1) Assistant	$2,500		
(2) Assistant Second Year	900	$3,400	
Current Expenses—			
(1) Traveling Expenses	$ 300		
(2) Two Laborers at $600	1,200		
(3) Fertilizer for Field Crops	500	$2,000	
Permanent Improvement—			
(1) Clearing Land for Pasture and Feeds	$2,000		
(2) Farm Machinery and Tools	1,000	3,000	
(g) Pasture Grasses and Forage Crops.			
Salary—			
(1) Grass and Forage Specialist	$2,500		
(2) Assistant for Second Year	900	$3,400	
Current Expenses—			
(1) Traveling Expenses	$ 500		
(2) Freight and Express	250		
(3) Labor	1,000		
(4) Seeds and Miscellaneous	$ 300	$2,050	$70,145

IV. SUGAR CANE EXPERIMENTAL WORK.

Sugar cane has long been recognized as one of the valuable crops to Florida. Heretofore the State has never employed a sugar cane specialist who could give all of his time to the deevlopment of this important line of agriculture. With the large investments that are being made at the present time, the amount requested for this work seems trivial. A high-grade man is needed for this work to be able to give the small farmers, as well as the large cane growers, first-hand and exact information in regard to handling this crop.

Salary—			
(1) Sugar Cane Specialist	$3,000		
(2) Field Assistant	1,500	$4,500	
Current Expenses—			
(1) Traveling Expenses	$1,500		
(2) Fertilizer and Chemicals	2,500		
(3) Office and Laboratory Supplies	500		
(4) Field Supplies and Labor	1,000	$5,500	$10,000

V. SOILS AND FERTILIZERS.

The investigation in soils and fertilizer made in Florida has been very meager when compared with the necessities and demands for this work. The soils are so variable, and even soils that appear quite uniform are found to be extremely variable in crop production. The soil problems are so complicated and so difficult to work out that it requires the highest degree of skill. The soil conditions maintaining in North Florida vary materially and essentially from those occurring in South Florida. It is, therefore, necessary to secure the services of trained men to work on the problems of each of these sections. The foregoing work relates especially to the different changes taking place within the soil itself. The study of bacteria of the soil, the study of the different chemicals developed in the soil while the plant is growing, and the loss of food material from the soil, are problems that the soil chemist must solve. He must also determine the classification of the soils so that his findings may be most valuable to the farmers of the State, as well as the prospective farmer.

The problem of the effect of fertilizers on the plant growth is one that has been studied for the past fifteen years by the Experiment Station. The results of these studies have been found so valuable, especially as to the effects of the different fertilizers on Irish potatoes, sweet potatoes and citrus that it is deemed of highest importance that this work should be continued.

(a) General.			
Salary—			
(1) Physiological Chemist		$3,500	
(b) Co-operative Work on Different Soil Types.			
Salary—			
(1) Assistant North and West Florida	$2,500		
(2) Assistant South and Central Florida	2,500	5,000	
Current Expenses—			
(1) Traveling Expenses	$2,400		
(2) Special Chemicals and Fertilizer	1,500	3,900	
(c) Effect of Fertilizers on Plant Growth.			
Salary—			
(1) Assistant Chemist		2,000	
Current Expenses—			
(1) Experiments in Progress	$ 750		
(2) Apparatus and Supplies	1,750		
(3) Traveling Expenses	600	3,100	$17,500

VI. PECAN INVESTIGATIONS.

The pecan industry has grown to immense proportions in North Florida. The sales last year were reported to be worth more than four million dollars. The money invested in pecan groves must at least be worth ten times as much as the annual crop. It is of highest importance that the pecan crop be given thorough and special attention. A specialist whose sole duty it is to make general studies of the pecan crop should be employed. He should have two assistants, one who would give all of his time to the study of pecan diseases and another to the study of the pecan insects. The specialist himself should devote all of his time to the study of the pecan tree, its fertilization, cultivation, best varieties and varieties best adapted to certain kinds of soils.

Salary—			
(1) Specialist	$2,500		
(2) Assistant	1,200	$3,700	
Current Expenses—			
(1) Traveling Expenses	$1,600		
(2) Field Experiments	1,200	2,800	
Permanent Improvements—			
(1) Microscopes, Laboratory Apparatus and Supplies		1,000	$7,500

VII. PLANT PATHOLOGICAL WORK.

FRUIT AND NUT PATHOLOGY.—The work done by the Experiment Station through its plant pathologists has attracted so large attention that it has been impossible to keep the same pathologist for any length of time; other States being able to offer them far larger salaries and better equipment than was possible for us. We have been training for other institutions. This line of work should be continued, however, since it has given some of the most profitable results that have been attained by the Experiment Station. This work should be continued and enlarged since the need for this work has more than doubled in the last four years.

FIELD CROP AND TRUCK PATHOLOGY.—The study of diseases of truck crops has been carried on for more than twenty-five years. The results of these studies have been most satisfactory and have saved many thousands of dollars to the State. This work should not only be continued but should be enlarged to include the pathology of field crops. In some portions of the State, entire areas of corn are destroyed by an unknown and unstudied disease known as frenching. Hundreds of acres of corn are lost annually by a sudden wilting and dying of the plants generally thought to be due to a bacterium. Sweet potatoes are subject to attack of a large number of diseases. Careful survey shows that farm crops worth several millions of dollars are annually destroyed by what are apparently preventable diseases. The studies on these diseases, therefore, should be enlarged so as to include the study of diseases of field crops as well as truck crops.

DECAY IN TRANSIT.—The amount of truck and citrus fruits, sweet potatoes and other farm crops that decay in transit is enormous. In a single year the loss sustained by the producers of citrus fruits alone amounts to more than a million dollars. By co-operating with the Federal Department of Agriculture and the Bureau of Markets, it would be possible for Florida to reduce this decay in transit quite as much as California reduced the decay in transit from that State to markets. This will require the services of a specialist throughout the entire year and at least three assistants during the most active shipping season, running from November 1 to June 1. Last year the Agricultural College was able to save many thousands of dollars to the watermelon growers of Florida through the employment of a single specialist for a period of three months. This work is new and difficult and at the same time one of the most profitable.

(a) Fruit and Nut.			
Salary—			
(1) Professor of Fruit and Nut Pathology	**$3,500**		
(2) Assistant Plant Pathologist	**2,500**		
(3) Laboratory Assistant	**1,000**		
(4) Office Assistant	**1,200**	**$8,200**	
Current Expenses—			
(1) Traveling Expenses	$1,500		
(2) Expenses in Field Experiments	1,500		
(3) Citrus, Avocado, Mango and Field Work	2,500		
(4) Laboratory and Office Supplies	750	6,250	
(b) Field Crops and Truck.			
Salary—			
(1) Professor of Truck Pathology	$3,500		
(2) Assistant Plant Pathologist	2,500		
(3) Laboratory Assistant	1,000	7,000	
Current Expenses—			
(1) Traveling Expenses	$1,500		
(2) Field Experiments	1,000		
(3) Laboratory and Office Supplies	750	3,250	
(c) Decay in Transit.			
Salary—			
(1) Chief Pathologist	$3,500		
(2) Three Assistants (part time)	3,000	6,500	
Current Expenses—			
(1) Traveling Expenses	$3,000		
(2) Supplies, Apparatus, Etc.	2,500	5.500	$36,700

VIII. ENTOMOLOGY.

The value of farm crops and other property destroyed by insects annually in Florida amounts to many million dollars, varying from season to season. Fully 50 per cent. of the amount that is destroyed could be saved without material cost if the proper remedies were known and applied. The work done by our entomologists here in the Experiment Station is netting the citrus growers at least three million dollars annually. It is netting the grain producers of the State many hundreds of thousands of dollars. With all the work that has been done, it has by no means been completed. The Experiment Station has carried out entomological studies successfully for more than 25 years and the annual saving to the State as a result of these studies has been greater than the cost of the entire institution for its entire time. With the enlargement and development of our

knowledge of controlling these parts, the work of the farmer and animal husbandman become much more certain and safe. The citrus groves are no longer devastated and destroyed by insects as formerly. The army worm in the sweet potato fields is so well under control by known methods that the annual loss has been reduced to a small fraction of what it was formerly. In spite of all the work that has been done there are still many problems in insect control that need investigation and need working out.

Salary—			
(1) Professor of Entomology	$3,500		
(2) Entomologist for Field Work and Lectures	2,500		
(3) Assistant Entomologist for Laboratory	1,800		
(4) Laboratory Assistant (part time)	600	$8,400	
Current Expenses—			
(a) General.			
(1) Correspondence and Office Work	$ 750		
(2) Office Supplies	250		
(b) Citrus and Tropical Fruit Pest Work.			
(3) Field Work, Spraying and Control	600		
(4) Introduction Beneficial Insects	500		
(5) Traveling Expenses	350		
(c) Farm Crop Pest Work.			
(6) Chemicals and Other Supplies	200		
(7) Labor in Field	600		
(8) Chemicals and Field Supplies	800		
(d) Truck Pest Work.			
(9) Root Knot Experiments	450		
(10) Insects	400		
(11) Chemicals and Supplies	500		
(12) Traveling Expenses	400		
(e) Camphor Thrips.			
(13) Chemicals, Supplies and Labor	150		
(14) Traveling Expenses	100		
(f) Deciduous Fruit Pest Work.			
(15) Labor and Field Supplies	300		
(16) Traveling Expenses	200	$6,550	$14,950

IX. EXPERIMENT TEST GROUNDS.

The introduction and breeding of new plants has been carried on by the Experiment Station for more than fifteen years. It was the experiment test ground that introduced and disseminated many of the known varieties of velvet bean. There are now on the Experiment Station test grounds a score of species of plants that should be carefully studied, developed and disseminated. The Tung nut, which produces oil, has given such fine results that there seems to be a certainty that this may be added soon as one of the important crops of Florida. Many thousands of ornamental and economic plants need to be brought in from other countries and tested out. An enumeration of the plants that have been introduced and disseminated from the test grounds is impracticable here.

Salary—			
(1) Experimenter	$1,200		
Current Expenses—			
(1) Two Laborers at $600)	1,200		
(2) Feeds and Fertilizers	500		
(3) Miscellaneous	175	$1,875	
Permanent Improvement—			
(1) Repairs and Building		$ 500	$3,575

X. EXPERIMENT STATION LIBRARY.

The library is an essential department of the Experiment Station. It is here that the bulletins from all other Experiment Stations, bulletins from the U. S. Department of Agriculture, as well as bulletins from Experiment Stations located all over the world, are collected, classified and catalogued, so that they are immediately available to the workers of the Experiment Station. In addition to the workers of the Agricultural College, the students in the college find this an extremely valuable reference library. Our library has not only been used by people of other states, but has been used by people from other countries as far away as Japan and China.

Salary—		
(1) Librarian		$2,000
Current Expenses—		
(1) Labor and Help in Cataloguing	$ 500	
(2) Freight and Incidentals	75	$ 575

Permanent Improvements—			
(1) Double Book Stacks	$ 375		
(2) Binding Bulletins and Report	500		
(3) Purchasing Reference Books	200		
(4) Filing Cards and Cabinets	50	$1,125	$3,700

XI. BRANCH EXPERIMENT STATION.

The Branch Experiment Station, located at Lake Alfred, Florida, was established by the Legislature in 1917. The citizens of Polk County have contributed over ten thousand dollars in money toward the establishment and upkeep of this Branch Station. It is one of the most important extensions of the Experiment Station work that has occurred in recent years. The central station is too far north to enable us to establish and maintain a large citrus grove. It is, therefore, necessary to go to the citrus district to start long time experiments. This kind of work if it is purely an experiment is difficult to carry out co-operatively and expensive to the owner of the grove. Individual citizens cannot be expected to bear the expense of experiments that will benefit all of the industry as well as the State as a whole. The State should bear this expense and give the citizens the benefit of the results of the work. In starting real experiments it cannot be foretold which of the experiments will benefit the trees greatly and which will be injurious. It is impossible to tell beforehand whether a new spraying mixture for insects will not be seriously detrimental to the citrus trees. There are many formulae of spraying materials that were at one time popular which had to be abandoned because of the unfavorable effect on the tree when used for a considerable time. In fertilizer experiments it cannot be foretold what quantity will be seriously harmful to the tree. New and cheaper fertilizers are constantly coming on the market. It is impossible to say beforehand whether this will be beneficial or harmful when used on Florida soils. There are many other questions that the State must settle on its own property and not depend upon the gratuity of private citizens for carrying out such work. The State should generously support this Branch Station, which has for its primary object the experimentation upon citrus trees in the field.

When the State becomes more wealthy it will be desirable to establish branch experiment stations in various parts of the State. This is the most economical and satisfactory way of carrying out broad lines of experimentation. The various scientists at the Experiment Station will from time to time make these branch stations their headquarters and carry on the investigations needed to be pursued in that specific locality.

Salary—			
(1) Superintendent		$2,000	
Current Expenses—			
(1) Two Laborers at $600	$1,200		
(2) Fertilizer for 15 Acres Citrus	1,500		
(3) Feed for Mule	150		
(4) Miscellaneous Expenses	600		
(5) Nursery and Breeding Experiments	900		
(6) Spraying Experiments	600		
(7) Fertilizer Experiments	400	$5,350	
Permanent Improvements—			
(1) Superintendent's Cottage	$3,000		
(2) Well and Water Supply	750		
(3) Combination Barn and Tool Shed	350		
(4) One Mule	150		
(5) Plows, Harness and Tools	150		
(6) Fencing Cleared Lands and Groves	400		
(7) Laboratory Building	$3,500	$8,300	$15,650
Total Experimental and Field Work			$198,670
Less Government Funds			$30,000
Total Annual State Appropriation for Experiment Station			$168,670

TO MATCH FEDERAL AID FOR COUNTY AND HOME DEMONSTRATION AGENTS CO-OPERATIVE DEMONSTRATION IN AGRICULTURE AND HOME ECONOMICS.

For carrying on work co-operatively between the Agricultural College, Woman's College and Negro College through County Agents, Home Demonstration Agents, Boys' and Girls' Club Work and Specialists.

The Smith-Lever Congressional Act appropriates approximately $49,000 for the fiscal year beginning July 1, 1921, provided Florida appropriates $39,000 as an offset, and for the fiscal year beginning July 1, 1922, approximately $54,000, provided Florida appropriates $44,500. (The exact amount is determined by the proportion of rural population of Florida bears to the total rural population of the United States as shown by each United States census).

The funds are expended under the rules and regulations of the United States Department of Agriculture and in accordance with the act of the Florida Legislature approved May 25, 1914.

Amount Needed July 1, 1921	$ 39,000	
Amount Needed July 1, 1922	44,500	
Total for Biennium		$ 83,500

DIRECTORS' BIENNIAL REPORT

AGRICULTURAL EXPERIMENT STATION

UNIVERSITY OF FLORIDA.

John M. Scott, Vice Director.

To the President:

I have the honor to submit herewith the report of the Experiment Station for the biennium closing June 30, 1920.

It is evident from the requests that come to the Experiment Station that the people of the State are taking a more active interest in the Experiment Station and the work it is doing.

This also indicates that they have confidence in the work of the Experiment Station. We are glad to see this. A large part of the world's business is done on confidence. As soon as people lose confidence, business slumps and the result is hard times.

The same principle holds true in experimental work. It is much easier to do the work, and much more work can be accomplished when the workers realize that the people of the State have interest in their work.

The following is a list of the bulletins published during the period covered by this report.

No.	Title.	Edition.	Pages.	Total Pages.
149	Some Diseases of the Fig	15,000	12	450,000
150	Florida Citrus Diseases	20,000	98	1,960,000
151	Florida Truck and Garden Insects	8,000	102	816,000
152	Velvet Bean Varieties	20,000	22	440,000
153	Napier and Merker Grass	20,000	16	320,000
154	Citrus Fertilizer Experiments	15,240	48	731,520
155	Prussic Acid in Sorghum	13,400	8	107,200
156	Sweet Potato Fertilizer Experiments	10,223	8	81,784
157	Soft Pork Studies	10,000	8	80,000
		131,863	322	4,986,504

In addition to the above, twenty-seven press bulletins have also been published.

CHANGES IN STATION STAFF.

There were a large number of changes in the staff during the biennium. Putting on new men, whether they be heads of departments or assistants, always makes more or less of a break in the work. It takes time for new men to become acquainted with conditions and to do their best work.

The majority of these changes were due to the fact that other institutions and private corporations offered better salaries and better facilities for work.

G. C. Oberholtzer resigned as farm foreman August 31, 1918. On September 1, 1918, A. W. Leland became foreman of the Experiment Station farm.

On April 21, 1919, Philip A. Macy accepted the position as assistant chemist, continuing his work until September 20, 1919.

Miss Evelyn Osborne was assistant entomologist from March 1, 1919, to June 30, 1919.

Carl T. Link worked as laboratory assistant in plant pathology from February 2, 1918, until June 30, 1919.

B. F. Floyd, plant physiologist, resigned November 15, 1919.

S. E. Collison resigned his position as chemist March 1, 1919.

R. W. Ruprecht was appointed physiological chemist May 1, 1920.

G. C. Roberts was appointed laboratory assistant in entomology May 3, 1920, and resigned at the close of the fiscal year.

J. R. Gunn was appointed laboratory assistant in plant pathology, beginning his work May 27.

Miss S. L. Vinson resigned as editor May 10, 1920.

Miss E. G. Shaw resigned as secretary October 15, 1919.

Miss Ruby Newhall was appointed secretary October 15, 1919.

ANIMAL INDUSTRY.

The work of the animal industrialist has been continued along the same lines as previously. Data has been gathered regarding the production of dairy cows. There has always been the opinion that good dairy cows would not produce as much milk in Florida as in the States further north. There is sufficient evidence now to show that cows will produce as liberal flow of milk in Florida as elsewhere.

There are a number of cows in the State having authentic milk records which would be creditable to any State.

During the biennium the Florida Agricultural Experiment Station placed on the Register of Merit the purebred Jersey cow Oxford Lad's Jewel No. 271481. In twelve months, or 365 days, she produced 8,269.8 pounds (961.6 gallons) milk and 451.95 pounds butter. There are other Jersey and Guernsey cows in the State with just as good and better records.

There have been some additions to the dairy herd. The Jersey bull, Florida Lasifoso No. 181522, was purchased from Fairview Farms, Atlanta, Ga. This young bull was sired by the son of Lass 64th, No. 106612, he by Pogis 99th of Hood Farm No. 94502. The dam of Florida Lasifoso is Victorious Buttercup No. 279264. This cow has a good record for the production of both milk and butter. In 365 days she produced 10,730.9 pounds or 1,247.7 gallons milk and 681.74 pounds butter.

A pure-bred Holstein Friesian bull, Burke Neptune Korndyke No. 304599, was purchased from Mr. J. C. DeBevoise, Jacksonville, Fla. Four high-grade Holstein-Friesian heifers were purchased from a breeder in Wisconsin. These will be a foundation for a grade herd.

BEEF PRODUCTION.

Two lots of steers were fed. The steers used were good high-grade Angus and were about eighteen months old when the experiment began. The feeds compared were peanut meal feed, that is peanut meal with the hulls, and velvet bean feed, that is velvet bean meal including the hulls. The rations used were shelled corn, velvet bean feed and silage. The other lot was fed shelled corn, peanut meal feed and silage. It will be noted that these feeds are all home grown. In other words, they are feeds that are, or can be, produced on every farm in the State.

Both of these rations gave very satisfactory results so far as producing gain was concerned.

SOFT PORK STUDIES.

Soft pork is not a new problem in Florida. It is a subject that has attracted the attention of the hog raisers in all Southern States during the past twenty years or more. All of the experiment stations in the South, and even in Canada, have worked on this problem.

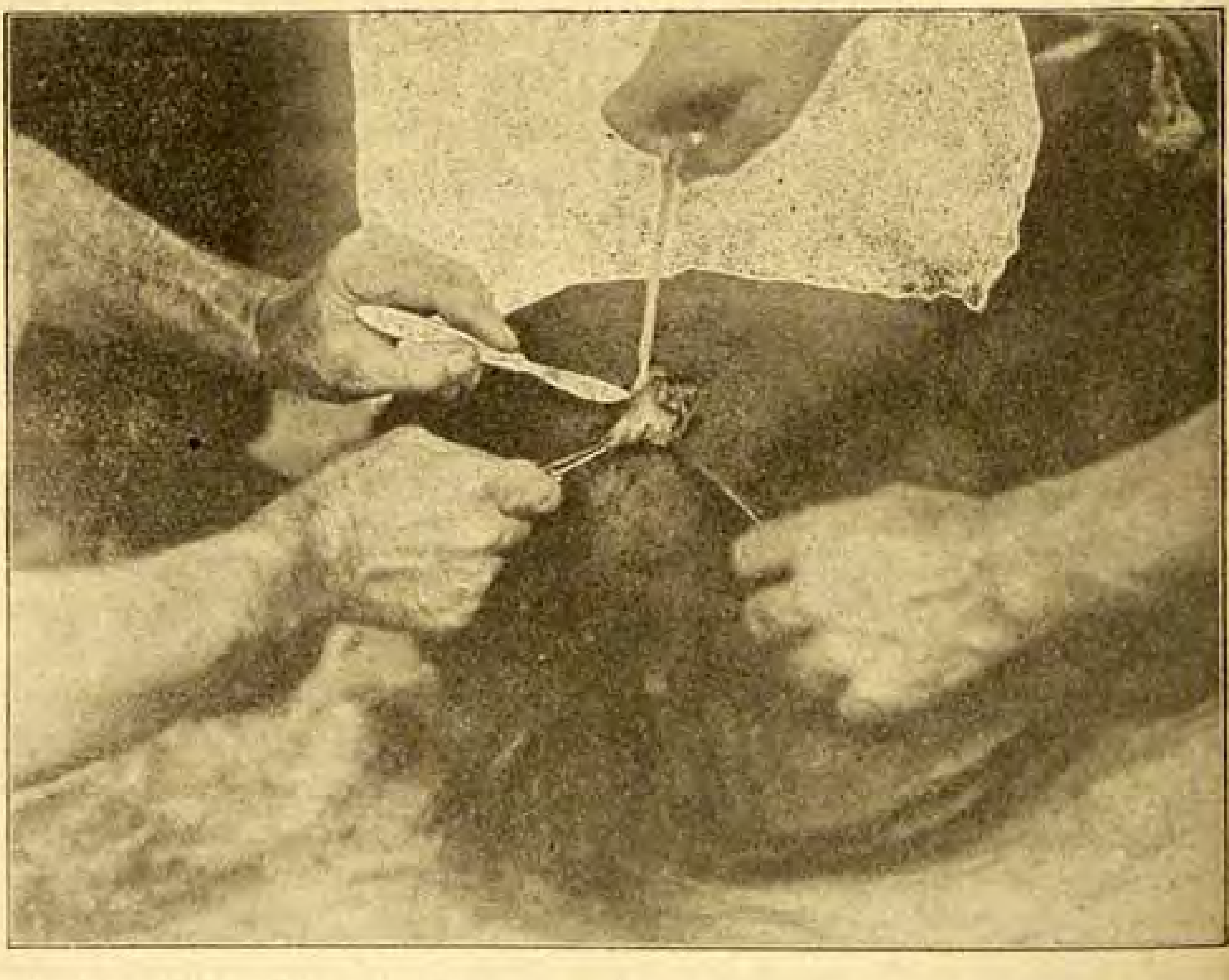
However, little progress has been made toward solving the difficulty or determining the cause of soft pork.

The Florida Experiment Station has been conducting pig feeding experiments for a number of years to determine, if possible, how the feeds used affected the quality of the pork produced. Peanuts have always been considered the cause of soft pork. Since peanut meal was becoming a commercial feed product, a number of feeding experiements were conducted for the purpose of finding out, if possible, what part of the ration could be made up of peanut meal and still produce hard pork.

The results from these experiments were more or less conflicting. No definite conclusion could be drawn. It seemed that, regardless of the proportion of peanut meal fed, some of the carcasses would chill hard in the cooler and some would remain soft, even after being in the cooler forty-eight hours.

TAKING SAMPLES OF FAT FROM LIVE HOGS.

It was believed that the only satisfactory way to determine the effect of fat on the carcasses was to find out before starting the feeding experiments whether the fat of the animals was hard or soft. The taking of samples of fat from live hogs and determining the melting point of the fat was a new factor. On January 21, 1920, with the assistance of Dr. A. L. Shealey, professor of veterinary science of the University of Florida, samples of fat were taken from three live hogs. These samples were from the posterior part of the ham. An incision about two inches long was made and a piece of fat taken out. No muscular tissue was removed. The incision was thoroughly disinfected before and after the operation. Usually two stitches were taken to close the incision. Much to our surprise we found that the taking of the sample did not interfere with the animals making a normal gain in weight during the experiment. The following illustration will show how the operation was performed. The fat samples were rendered at 110° centrigrade and the melting point determined.



On March 8, 1920, a feeding experiment was started, the object being to make a study of how certain feeds affect the melting point of fat of hogs. Nine shoats were selected for the experiment, six being barrows and three sows. Samples of fat from these animals were taken and the melting point determined. Two barrows and one sow were placed in each lot. Each pig was ear marked and given an identification number. A record of the individual weights and gains was kept.

The results of these experiments show quite clearly the effect that feeds have on the melting point of fat of individual hogs. This shows that the feeding of peanuts for a period of 44 days softened the fat materially. It also shows that a ration composed of corn, shorts and peanut meal with the hulls, equal parts by weight, and a small amount of skim milk daily, had a very marked effect on the hardening of the fat of peanut-fed hogs. Also a ration composed of corn, shorts and cottonseed meal had a very marked effect on hardening the fat of peanut-fed hogs.

When these hogs were slaughtered and placed in the cooler all carcasses chilled hard and were entirely satisfactory. This would indicate very strongly that where care and judgment is taken in fattening hogs for market Florida farmers can produce pork of good quality, and that hereafter there should be little complaint from packers on soft pork.

FERTILIZER EXPERIMENTS.

Fertilizer experiments have been conducted on sweet potatoes and Japanese cane. The sweet potato experiments indicate clearly that if we are to maintain the yield of sweet potatoes, we must use fertilizer containing a liberal amount of potash.

TABLE ——

FERTILIZERS USED IN EXPERIMENT, AND THE AMOUNT APPLIED TO EACH ACRE.

Kind of Fertilizer Used.	Pounds to the Acre.							
	Plot I	Plot II	Plot III	Plot IV	Plot V	Plot VI	Plot VII	Plot VIII
Dried blood	112	...	112	...	112	...	112	112
Sulphate of ammonia....	...	...	...	72	...	72	...	...
Muriate of potash.......	84	84	...	84	84	...	...	...
Sulphate of potash	...	...	...	...	...	84	84	84
Acid phosphate	...	224	224	224	224	224	224	224
Ground limestone*	...	...	...	...	...	...	...	2000

*Applied only in 1915, 1917 and 1919.

TABLE ——.

SWEET POTATO FERTILIZER EXPERIMENTS—ACRE YIELD IN BUSHELS.

Plot	1915	1916	1917	1918	1919	5-Year Average
I	245.6	153.6	222.4	113.6	24.0	151.8
II	221.6	177.6	240.0	161.6	33.6	166.8
III	99.6	86.4	72.0	60.8	6.4	65.0
IV	259.6	228.8	294.4	161.6	57.6	200.4
V	252.0	182.6	276.8	249.6	59.2	204.0
VI	216.0	128.0	320.0	163.2	40.0	173.4
VII	222.0	203.2	251.2	153.6	99.2	185.8
VIII	269.6	110.4	232.0	153.6	168.0	186.7

It would seem from the above tables that Plot III, which received no potash in the fertilizer from 1915 to 1919, did not produce half the yield of any of the other plots. Plott II, which received no ammonia during the same period, produced, on an average, more than two and a half times the yield of Plott III, which received no potash.

FERTILIZER EXPERIMENTS.

The fertilizer experiments with Japanese cane, which have been conducted for the past ten years, show two rather important points. First, that the acre yield depends very largely on the amount of ammonia in the fertilizer and also on frequent replantings. From the results it would seem that it makes little difference what the source of ammonia, if there is a sufficient amount of plant food to produce good growth. It is also evident that in order to produce the best yields, Japanese cane must be replanted every three to five years.

The growth and development of citrus trees when given different fertilizer treatment has been studied during the past ten years. Among the important points brought out in this work the following may be mentioned: Sulphate of ammonia, acid phosphate and high-grade sulphate of potash give best results. Nitrate of soda, as a source of nitrogen; steamed bone and floats, as a source of phosphoric acid; and low-grade sulphate of potash, hard wood ashes and muriate of potash, as sources of potash, give good results.

At the present time experiments are in progress to test the availability of raw Florida phosphate as compared with acid phosphate. Experiments are in progress on both citrus trees and potatoes. The potato experiments have shown that raw phosphate becomes available slowly, and will increase the yield over a plot where no phosphate has been applied. From a money standpoint, however, $1.00 invested in acid phosphate will bring a return of about $12.00, while raw phosphate will bring a return of $8.00.

SOIL FERTILITY.

As in previous years the work of the chemist has been to determine how fertilizers affect the growth of citrus trees. A large amount of time has been given to studying the leaching of fertilizers.

INSECT AND OTHER PESTS.

The work of the entomologist has been largely devoted to a study of a number of insects that, at the time, may be called pests in this State.

Among those studied is nematodes, their control and eradication by the use of sodium cyanide, ammonium sulphate and by summer fallow.

The velvet bean caterpillar, **Anticarsia gemmatilis,** its distribution, how affected by climatic conditions, host plants and methods of control by spraying and natural enemies, has been studied.

Thrips and plant bugs, a study of the different species and their host plants and control, were studied.

The California Whitefly-eating Delphastuc is doing good work in some groves in the State.

PLANT DISEASES.

Plant diseases are one of the important considerations in the production of crops. However, we have very few, if any, plant diseases in Florida that cannot be controlled if given prompt attention when first appearing.

The diseases that have been studied by the plant pathologists during the biennium are citrus scab, scaly bark, stem-end rot, melanose, citrus canker, foot rot, seed bed diseases, buckeye rot of tomato fruit, phomopsis of eggplant, corn stem rot, pepper fruit soft rot, Irish potato late blight and pineapple wilt.

This shows that the work has not been confined to any one industry but has covered a large number of crops produced in the State.

FORAGE PLANTS.

There is hardly any other subject that is of more vital importance to the citizens of the State than that of forage plants. This subject becomes of more importance as the livestock industry of the State develops. Grass and forage crops are a necessity for livestock production. Any county, State or country that does not produce an abundance of these will never rank as a livestock producing section.

The Experiment Station has in the past tried out a large number of introduced grasses and forage crops.

During the past two years, more or less work has been done with a number of grasses that are proving to be of value to the State.

BRANCH EXPERIMENT STATION.

The Legislature of 1917 authorized the establishment of a branch experiment station. After looking over a number of locations, a site in Polk County was selected. This site is within one mile of the railway station at Lake Alfred. The tract of land consist of eighty-four acres.

The addition of a branch station will be of much value to the State for investigational purposes. Heretofore, we have not had facilities available for doing investigational work along citrus lines as we should have had. It has been necessary to carry on our citrus fertilizer work and citrus spraying work co-operatively with grove owners. We have had the best of co-operation with these grove owners, but such arrangements are not ideal. There are many necessary things in experimental work that grove owners do not take to kindly. In experimental work the results cannot be foretold. In other words, an experiment may prove a failure. With the establishment of this branch station, the workers in the Experiment Station will be enabled to do more effective work on citrus than heretofore.

It will also give an opportunity to test out forage crops suitable for citrus growers to use as cover crops in their groves and as a source of feed for the necessary livestock kept on their farms.

SOME THINGS THE STATION HAS ACCOMPLISHED.

The Florida Agricultural Experiment Station is by no means at the foot of the list in regard to investigational work accomplished.

The discovery and introduction of fungi and insects destructive to plant pests has been of untold value to the citrus industry.

The control by spraying of many insect pests and fungous diseases that attack both citrus and vegetable crops, has been worth more to these two industries than what the State has appropriated for the Experiment Station during the past thirty years.

Ten years of fertilizer experimenting on citrus trees, using sulphate of ammonia, acid phosphate and high-grade sulphate of potash, gave good results.

The introduction of the velvet bean and the testing out of its value as a feed, forage and soil improving crop has been worth millions of dollars to the State.

The fertilizer experiments conducted on Japanese cane and sweet potatoes will always be referred to as authority on such questions.

The feeding experiments with Florida-grown feeds for milk and beef production have convinced the most skeptical that it is possible to produce both milk and beef in Florida.

Creole's Lassie Sue, a pure-bred Jersey cow, bred and raised in Florida, and which has been in the station dairy herd for several years, was the first Jersey cow in Florida to enter the Register of Merit. Her record at three years and eleven months of age was 7,708.6 pounds, or 896 gallons milk, and 436.7 pounds butter in 365 days. Another Jersey cow in the herd, Oxford Lad's Jewel, made the Register of Merit with a record of 8,269.8 pounds, or 961.6 gallons milk, and 451.9 pounds butter in 365 days.

There can be no further question as to the ability of cows to produce just as much milk in Florida as in any other State.

The latest and perhaps the most important work of the station has been the studies on soft pork. Studying the effect of feed on the quality of the fat by taking samples of fat from live hogs as has been done here the past year, has attracted the attention of all animal nutrition men. As expressed by one writer, "Besides the glory, the advertising, the State pride, the State of Florida can vote $100,000 for a thorough investigation and make an annual return of five thousand per cent. by producing hard pork instead of soft pork." Another well known authority, Prof. J. F. Duggar, of Alabama, says that the soft pork work of the Florida Agricultural Experiment Stations is superior to any ever conducted at any station in the United States.

Dr. H. J. Wheeler, formerly director of the Rhode Island Experiment Station, says, "It is a mighty interesting and valuable line of investigation and is most timely."

Dr. E. W. Allen, Chief of the Office of Experiment Stations, says, "It opens up the possibility of a new line of attack which I hope will greatly facilitate the solution of this vexed problem. The bulletin is certainly a significant contribution, and I congratulate you on it."

Jesse M. Jones says, "In my opinion you have opened up the largest field for investigations along this line that has been yet touched, and have opened it in such a way that definite results can be obtained which has not been true before."

REPORT OF ANIMAL INDUSTRIALIST.

P. H. Rolfs, Director.

Sir:—

I submit herewith the report of the Animal Industrialist for the biennium ending June 30, 1920.

Respectfully,

JOHN M. SCOTT,
Animal Industrialist.

Some of the important work accomplished by the Animal Industry Department has been the results obtained from feeding experiments in which velvet beans were used. These experimnts included feeding tests to determine the value of the velvet bean for both beef and milk production. In this work the Florida Experiment Station took the lead, or in other words, blazed the trail. Since that time the other Southern experiment stations have conducted similar experiments, the results of which have been almost identical with those obtained here.

The results of these experiments showed that from two to two and one-half pounds of velvet beans in the pod are equal to one pound of bright cottonseed meal for beef and milk production.

This means much to the farmers of the State, due to the fact that the boll weevil has reduced materially the cotton acreage and to the normal conditions of the past few years, wherein the cost of all feed products, including cotton seed meal, has increased. The market price of velvet beans has advanced, but, even under present conditions, four or five acres of velvet beans can be grown for much less money than one ton of bright cottonseed meal be purchased. At the present time, one ton of cottonseed meal will cost about $80. If it costs as much as $16 an acre to grow velvet beans, with an average yield of one ton to the acre, two and a half tons or two and a half acres, would cost $40, a saving in feed value of $40 in favor of the velvet beans.

Farmers of the State have not been slow to realize the importance of the velvet bean as a feed. The results has been that the acreage during the past ten years has increased materially. The acreage in the State last year was estimated at 270,000 acres, with a yield of about five and a half million bushels.

The results of these experiments show that from two to two and a half pounds of velvet beans in the pod were equal to one pound of bright cottonseed meal for beef and milk production. The experiments in beef production when velvet beans were used gave the following results:

Steers in a feeding experiment of eighty-four days made an average daily gain per 1,000 pounds live weight of 4.15 pounds. The cost a pound of gain with the velvet bean ration was nearly 40 per cent. less than with the cottonseed meal ration. A saving of 40 per cent. in the cost of production is equivalent to a 40 per cent. profit.

In the experiments in milk production in nearly all cases the cost of production was less when velvet beans was fed.

The use of peanut meal for beef, milk and pork production has been tested out with satisfactory results. During the past four or five years the peanut crop has become important in Florida. The Florida acreage is not far from 100,000, yielding 2,000,000 bushels. The peanut has, in the past, been grown almost entirely as a crop for feeding hogs. It is well known that hogs raised or fattened exclusively on peanuts produce soft pork. The results of experiments in which peanut meal was used indicate that one-third of the grain ration can be peanut meal and still produce pork of good quality. Not only does peanut meal produce pork of good quality, but it also produces satisfactory gains in weight.

The use of peanut meal for pork production means much to the State. It is estimated that Florida has about 1,500,000 hogs. If one-third the feed used is peanut meal and still the pork is hard, it means that Florida can raise a third more hogs without increasing the corn yield. This would mean an increase of a half million head of hogs from the farms of Florida each year. It is not difficult to estimate the gross income from this increase.

PIG FEEDING EXPERIMENTS.

Some interesting feeding experiments were conducted during the biennium. The first of these were to find out how much peanut meal could be used in a ration and still produce pork of good quality.

Lot I was fed ground corn only, Lot II fed ground corn and tankage in self-feeder in the proportion of 10 to 1. Lot III was fed ground corn two parts, and peanut meal without hulls, one part. Lot IV was fed ground corn and peanut meal without hulls, equal parts by weight.

The following table gives the weight and gains produced:

TABLE—WEIGHTS AND GAINS.

	Lot I	Lot II	Lot III	Lot IV
Weight at beginning (4 pigs)	360.0	395.0	358.3	401.6
Weight at end (4 pigs)	662.1	1097.0	793.2	870.4
Total gain in 130 days	302.1	702.0	434.9	468.8
Average daily gain	.581	1.35	.837	.902

At the close of the experiment the hogs were shipped to Armour & Co., in Jacksonville. All were ear-marked so they could be identified in the cooler. After slaughtering the carcasses were placed in the cooler for forty-eight hours and then examined.

Lot I, fed ground corn only, two carcasses chilled hard and one remained soft; Lot II, fed ground corn and tankage, ten to one, all carcasses chilled hard; Lot III, fed ground corn two parts and peanut meal without hulls one part by weight, all carcasses were soft; Lot IV, fed ground corn and peanut meal, equal parts by weight, two carcasses chilled hard and two soft. These results, so far as producing hard pork, are confusing, for corn alone produced both hard and soft carcasses. Ground corn and tankage, fed ten to one, produced all hard carcasses; ground corn, two-thirds, and peanut meal one-third, all were soft. Ground corn and peanut meal, equal parts, two carcasses were hard and two were soft.

Another lot of four hogs were fed on corn, and peanut meal, equal parts by weight and a little skimmed milk. The feeding period was from June 15 to January 3. In this lot two carcasses chilled hard and one soft. This result was similar to those obtained in the past, and also similar to those of other experiment stations studying this problem. That is, no definite results had been obtained in comparing feeds for the production of hard and soft pork.

TAKING SAMPLES OF FAT.

These results led to the belief that some other method must be pursued in order to get definite information on this problem. The thought occurred to us that it would be necessary to determine the melting point of fat from each individual hog before starting the feeding experiment. The taking of samples of fat from live hogs and determining the melting point was a new venture but we knew of no other way of solving the problem. We could find little or no published literature giving information on this phase of the work. On January 21, 1920, with the assistance of A. L. Shealy, professor of veterinary Science, University of Florida, samples of fat were taken from three hogs. The fat samples obtained were rendered at a temperature of 120 degrees, centigrade, and the melting point of fat determined in the usual manner. A number of samples of fat were taken from live hogs during February. On March 8, 1920, a feeding experiment was started, the object being to study how certain feeds effect the melting point of fat. Nine shoats were selected for the experiment. Samples of fat from each of these animals were taken and the melting point determined. These nine pigs were about eleven months old at the beginning of the experiment. Each pig was ear-marked so they could be identified and a record of the individual weights and gains kept.

FEEDS GIVEN.

Lot I was fed peanuts only for forty-four days. Lot II was fed corn and shorts, equal parts by weight, and bright cottonseed meal, equal in weight to one-eighth of the corn and shorts. Lot III was fed corn, shorts and peanut meal, with the hulls, equal parts by weight. In addition to this grain ration Lot III was given one and one-half gallons of skim milk daily.

WEIGHINGS.

All weights given in this bulletin are the average of weights taken on three consecutive days.

TABLE I.—PIG FEEDING EXPERIMENTS IN SOFT PORK STUDIES.

Lot I.—Fed peanuts only.

Pig No.	Date	Age	Weight, lbs.	Sex	Melting point of fat	Date	Weight lbs.	Gain in weight in 44 days, lbs.	Melting point of fat	Difference in melting point of fat
3	Mch. 8	11 mos.	135	male	40.5°C	Apr. 20	173.3	38.3	35.0°C	—5.5°C
4	Mch. 8	11 mos.	110	female	40.1°C	Apr. 20	140.0	30.0	37.0°C	—3.1°C
7	Mch. 8	11 mos.	140	male	40.5°C	Apr. 20	171.6	31.6	36.1°C	—4.4°C

Lot II.—Fed corn and shorts equal parts by weight and 1-8 cottonseed meal.

Pig No.	Date	Age	Weight, lbs.	Sex	Melting point of fat	Date	Weight lbs.	Gain in weight in 44 days, lbs.	Melting point of fat	Difference in melting point of fat
2	Mch. 8	11 mos.	130	male	39.0°C	Apr. 20	165.0	35.0	44.3°C	+5.0°C
5	Mch. 8	11 mos.	100	male	37.5°C	Apr. 20	133.3	33.3	41.2°C	+3.7°C
6	Mch. 8	11 mos.	130	female	37.8°C	Apr. 20	173.3	43.3	39.5°C	+1.7°C

Lot III.—Fed corn, shorts and peanut meal, equal parts by weight, and 1½ gallons skim milk.

Pig No.	Date	Age	Weight, lbs.	Sex	Melting point of fat	Date	Weight lbs.	Gain in weight in 44 days, lbs.	Melting point of fat	Difference in melting point of fat
1	Mch. 8	11 mos.	155	male	37.1°C	Apr. 20	216.6	61.6	38.9°C	+1.8°C
8	Mch. 8	11 mos.	125	male	36.4°C	Apr. 20	176.6	51.6	39.2°C	+2.8°C
9	Mch. 8	11 mos.	75	female	35.5°C	Apr. 20	108.3	33.3	39.7°C	+4.2°C

Table I gives in detail the date, age, weight, sex and melting point of fat of the nine pigs used in the experiment. The data given in the table is for the first half of the experiment. This shows that the pigs in Lot I were of the same age, of nearly equal weight, and that the melting point of the fat was very nearly the same.

From March 8 until April 20, 1920, a period of forty-four days, the pigs in Lot I were fed white Spanish peanuts only. During this time the three pigs, numbers 3, 4 and 7, made fairly satisfactory gains, so far as gain in weight was concerned.

The important fact in the table is that the melting point of the fat of pig No. 3 was lowered 5.5°C. (9.9°F.); of pig No. 4, 3.1°C. (5.5°F.) and of pig No. 7, 4.4°C. (7.9°F.), after being fed only peanuts for 44 days. In other words, the feeding of peanuts only had a very marked effect on lowering the melting point, or softening the fat.

The results of Lot II, fed corn and shorts, equal parts by weight, and one-eighth bright cottonseed meal, are interesting. After feeding the above ration for 44 days there was a satisfactory gain in weight of each animal. In fact, they made better gains in weight than did the pigs in Lot I. The all-important fact is that the ration had a very marked ffect on hardening or raising the melting point of the fat of each hog in this lot, the difference being from 1.7°C. to 5°C. The melting point of the fat of pig No. 2 was raised 5°C. (9°F.); of pig No. 5, 3.7°C. (6.6°F.) and of pig No. 6, 1.7°C. (3°F.).

It is evident that a ration of corn, shorts and cottonseed meal will produce hard pork.

Lot III, fed corn, shorts and peanut meal, with the hulls, equal parts by weight, and skim milk, made better gains in weight than did the pigs in either of the other lots. This ration also had a marked effect on hardening the fat of each pig. The melting point of the fat was raised from 1.8°C. to 4.2°C. The melting point of the fat of pig No. 1 was raised 1.8°C. (3.2°F.); of pig No. 8, 2.8°C. (5°F.), and of pig No. 9, 4.2°C. (7.5°F.).

REVERSING THE FEEDS.

As stated before, this experiment was divided in two parts. The first part of the experiment closed April 20, 1920. The second part began on April 23, 1920, and continued for 44 days, closing June 7, 1920. The same hogs were used throughout both parts of the experiment.

On April 23, 1920, the feeds for the three lots were reversed. The feed for Lot I was changed from peanuts only to corn, shorts, peanut meal with hulls, equal parts by weight, and one and one-half gallons skim milk daily. The feed for Lot II was changed from corn and shorts, equal parts by weight and one-eighth cottonseed meal, to peanuts only. The feed for Lot III was changed from corn, shorts, peanut meal with hulls and skim milk, to corn and shorts equal parts by weight, and one-eighth bright cotton seed meal. These changes in feed were made so as to make a further study of how feeds influence the melting point of fat.

TABLE II.—PIG FEEDING EXPERIMENT, WEIGHTS, GAINS AND MELTING POINT OF FAT.

Lot I.—Pigs Fed Corn, Shorts, Peanut Meal and 1½ Gallons Skim Milk.

Pog. No.	Date.	Weight, lbs	Sex.	Melting point of fat	Date.	Weight, pounds.	Gain in weight in 44 days, lbs.	Melting point of fat.	Difference in melting point of fat.
3	April 23	173.3	male	35.0°C	June 7	246.6	73.3	39.1°C	+4.1°C
4	April 23	140.0	female	37.°0C	June 7	196.6	56.6	38.1°C	+1.1°C
7	April 23	171.6	male	36.1°C	June 7	220.0	48.4	39.0°C	+2.9°C
Lot II—Pigs Fed Peanuts Only.									
2	April 23	165.0	male	44.3°C	June 7	166.6	1.6	41.6°C	—2.7°C
5	April 23	133.3	male	41.2°C	June 7	150.0	16.7	43.2°C	+2.0°C
6	April 23	173.3	female	39.5°C	June 7	130.0	—43.0	37.5°C	—2.0°C
Lot III.—Pigs Fed Corn, Shorts, equal parts by weight and 1-8 Cottonseed Meal.									
1	April 23	216.6	male	38.9°C	June 7	253.3	36.7	40.0°C	+1.1°C
8	April 23	176.6	male	39.2°C	June 7	220.0	43.4	40.2°C	+1.0°C
9	April 23	108.3	female	39.7°C	June 7	128.3	20.0	42.0°C	+2.3°C

Table II gives the date, weight, sex, melting point of the fat, gain in weight, and the difference in the melting point of the fat.

Hogs in all lots, except Lot II, made satisfactory gains during the second part of the experiment. It is difficult to give any reason or explanation just why the hogs in Lot II failed to make satisfactory gains. The loss in weight of sow No. 6 can be explained. During the early part of this feeding period, April 28, sow No. 6 farrowed a litter of five pigs and nursed them during the remainder of the experiment.

A glance at Table 18 shows that when the hogs in Lot I, which had been fed only peanuts for a period of forty-four days, were changed to a feed of corn, shorts, peanut meal, with hulls, and skim milk, the melting point of the fat was raised, or in other words, the fat was hardened to a noticeable extent. The melting point of the fat of pig No. 3, after being fed peanuts for forty-four days, was 35°C. (95°F.). After being fed a ration of corn, shorts, peanut meal, with hulls and skim milk for forty-four days the melting point of the fat was raised to 39.1°C. (102.3°F.) or a difference of 4.1°C. (7.3°F.).

The melting point of the fat of pig No. 4, after being fed peanuts for forty-four days, was 37°C. (98°F.). After being fed corn, shorts, peanut meal with the hulls, and skim milk for forty-four days, the melting point of the fat was raised to 38.1°C. (100.5°F.) or a difference of 1.1°C. (2°F.).

The melting point of the fat of pig No. 7, after being fed peanuts for forty-four days, was 36.1°C. (96.9°F.). After being fed corn, shorts, peanut meal, with hulls and skim milk for forty-four days, the melting point of the fat was 39.0° C. (102.2°F.), or a difference of 2.9°C. (5.2°F.).

This shows clearly that the fat of peanut fed hogs can be hardened to a marked degree by feeding a ration of corn, shorts, peanut meal with hulls and skim milk. The table also shows that the melting point of the fat can be lowered, i. e., made softer, by feeding peanuts. However, pig No. 5 seems to be an exception. It is difficult to explain why in this case the feeding of peanuts only did not lower the melting point of the fat. It may be a case of the individuality of the hog. The table also shows that the ration of corn, shorts and bright cottonseed meal raised the melting point of the fat, that is, hardened the fat.

TABLE III—SHOWING EFFECT OF FEED ON MELTING POINT OF FAT.

Pig No.	Date	Weight in lbs.	Melting point of fat	Date	Weight in lbs.	Melting point of fat	Date	Weight in lbs.	Melting point of fat
Fed peanuts only for 44 days.							Fed corn, shorts, peanut meal and skim milk 44 days.		
3	March 8	135.0	40.5°C	April 23	173.0	35.0°C	June 7	246.6	39.1°C
4	March 8	110.0	40.1°C	April 23	140.0	37.0°C	June 7	196.6	38.1°C
7	March 8	140.0	40.5°C	April 23	171.0	36.1°C	June 7	220.0	39.0°C
Fed corn, shorts and cottonseed meal for 44 days.							Fed peanuts only **44 days.**		
2	March 8	130.0	39.3°C	April 23	165.4	44.3°C	June 7	166.6	41.6°C
5	March 8	100.0	37.5°C	April 23	133.3	41.2°C	June 7	150.0	43.2°C
6	March 8	130.0	37.8°C	April 23	173.3	39.5°C	June 1	130.0	37.5°C
Fed corn, shorts, peanut meal and skim milk 44 days.							Fed corn, shorts and cottonseed meal 44 days.		
1	March 8	155.0	37.1°C	April 23	216.6	38.9°C	June 7	253.3	40.0°C
8	March 8	125.0	36.4°C	April 23	176.6	39.2°C	June 7	220.0	40.2°C
9	March 8	75.0	35.5°C	April 23	108.3	39.7°C	June 7	128.3	42.0°C

Table III shows at a glance the effect of the feed on the melting point of the fat. The melting point of the fat of pigs Nos. 3, 4 and 7 at the beginning of the test was 40.5°, 40.1° and 40.5°C., respectively. After being fed peanuts only for forty-four days the melting point of the fat was 35°, 37° and 36.1°C. The feeding of peanuts had a very softening effect on the fat. From April 23 to June 7 these three hogs were fed corn, shorts, peanut meal and skim milk. On June 7 the melting point of the fat was 39.1°, 38.1° and 39.0°C. That is, the feeding of corn, shorts, peanut meal and skim milk hardened the fat to some extent.

The melting point of the fat of pigs Nos. 2, 5 and 6 at the beginning of the test was 39.3°, 37.5° and 37.8°C. After being fed corn, shorts and cottonseed meal for 44 days the melting point was 44.3°, 41.2° and 39.5°C. This shows that the ration fed had a very marked effect on raising the melting point of the fat. From April 23 to June 7 these three pigs were fed peanuts only. On June 7 the melting point of the fat was 41.6°, 43.2° and 37.5°C. This shows that the feeding of peanuts only had a softening effect on the fat of the two pigs, but not on the third.

The melting point of the fat of pigs Nos. 1, 8 and 9 at the beginning of the test was 37.1°, 36.4° and 35.5°C. After feeding corn, shorts, peanut meal and skim milk for 44 days the melting point of the fat was 38.9°, 39.2° and 39.7°C. After feeding corn, shorts and cottonseed meal for 44 days the melting point of the fat was raised to 40°, 40.2° and 42°C.

CONCLUSIONS.

1. This is, apparently, the first report of a series of experiments conducted that shows the melting point of the fat at the beginning, at intervals during the test, and also at the close of the experiment.
2. The number of animals used is not sufficient from which to draw final conclusions.
3. The results of this experiment show that there is a wide field of usefulness in this line of investigation.
4. From the experiments it is evident that the melting point of fat is radically influenced by the character of the feed.
5. The data indicates that there is a large variation in the melting point of fat of different individuals regardless of the feed consumed.

In beef production, peanut meal has been found to produce satisfactory gains and beef of excellent quality.

There has been in the past an idea among many Floridians that dairy cows would not produce as much here as in other states. There is little or no foundation for such ideas. The Florida Agricultural Experiment Station has, during the past three years, placed two cows of its dairy herd on the Register of Merit.

Creole's Lassie Sue 306835 in 365 days produced 7,708.6 pounds, or 896 gallons of milk, which contained 374 pounds fat, or 436 pounds butter.

Oxford Lad's Jewel in 365 days produced 8,269.8 pounds, or 961 gallons milk, and 387.3 pounds fat, or 451 pounds butter. These are not exceptional records, but they show that good cows in Florida will produce a satisfactory flow of milk.

Fertilizer experiments with Japanese cane have been conducted since the spring of 1909. Two problems were studied in this work: (1) How different fertilizers influenced the yield of cane; (2) What effect fertilizers have on the quality of cane juice. The results of six years' work showed that fertilizers have little, if any, effect on increasing or decreasing the sugar content of the juice.

The kind and amount of fertilizer applied does have a very marked influence on the yield of cane. For instance, when barnyard manure was used at the rate of 30 wagon loads to the acre, the acre yield of green material was on an average of three years 19.8 tons. At the same time, and under similar conditions, when commercial fertilizer was used, a yield of 10.8 tons an acre was obtained. In other words, there was a difference of 9 tons an acre in favor of the barnyard manure.

SWEET POTATO FERTILIZER EXPERIMENTS.

Fertilizer experiments conducted with sweet potatoes have given us some satisfactory data. The results for five years indicate very closely the need of potash in the fertilizer, if the yield of sweet potatoes is to be maintained. The plot that received no potash produced a yield, for an average of five years, of 65 bushels. The yield from the other plots receiving potash was, on a five-year average, from 151 to 204 bushels an acre.

REPORT OF THE PLANT PATHOLOGIST.

P. H. Rolfs, Director.

Sir:

I submit herewith the report of the Plant Pathologist for the biennium ending June 30, 1920.

Respectfully,
H. E. STEVENS,
Plant Pathologist.

More attention has been given to citrus diseases than any similar group of diseases in Florida by workers of both the Experiment Station and the United States Department of Agriculture. The importance of the citrus industry has demanded this, together with well-organized efforts of the citrus growers of the State. A considerable amount of study has been given to all the principal citrus diseases that have been found in the State. This involved much technical work, most of which has been accomplished in the laboratory. Investigations have included scab, scaly bark, gumnosis, stem-end rot, melanose, citrus canker, foot rot, blight, anthracnose and minor troubles. In a number of cases the causes of the diseases have been definitely determined; the nature and habits of the causative agency studied; the conditions under which the disease develops and spreads investigated; and the practical control methods for these has been worked out.

In investigating any plant disease the first step is to determine the cause. This usually has to be done before any intelligent or effective control measures can be applied. Such work may be short and simple, or it may be long and complicated. The development of practical control measures requires a thorough knowledge of the disease as it occurs under field conditions, in conjunction with well-planned and well-executed field experiments of several years. The following diseases have been more thoroughly studied along these lines, and their results briefly summarized:

Citrus Scab.—This disease was introduced into the State many years ago, becoming at first troublesome on the sour orange and later on the lemon and rough lemon. It soon became widely distributed over the State, passing to the grapefruit, on which it is a serious pest. The cause of scab has been known for a long time, but many details concerning the spread and control of it were lacking for years after it became established. The Experiment Station began the study of the life history of this fungus parasite, and in the progress of the investigation many important factors were learned, which were later brought into practical use as a basis for control measures. These studies brought out the time the infection took place and the conditions necessary for the infection, and the length of time this growth was subject to attacks of the disease. This information formed the necessary basis for a spray schedule to control the disease as it indicated the time to spray and the number of sprayings necessary for complete control. Spraying experiments of a preliminary nature also brought out the fact that the weaker fungicides could be used effectively against this disease.

Scaly Bark.—This was a new disease that appeared localized to few areas in the State. It was peculiar to the sweet orange and caused serious injury to trees and considerable loss to fruits each season. The cause of this disease was discovered to be a fungus and the study of the habits of the fungus brought out the time and condition of the growth necessary for infection to take place and the period required for the disease to develop. These facts were necessary for the basis of control measures which were eventually outlined, and satisfactory means were devised for the control or prevention of the disease. It was found that by spraying between certain periods, injury to the fruit could be prevented. Heading back and spraying the trunk and limbs of the tree was effective in cleaning up the diseased tree, and top working immune varieties proved to be another method of prevention.

Stem-End Rot.—This was a new rot of citrus fruits which resulted in a decay, causing heavy losses in certain groves under certain conditions. Stem-end rot appeared to be more or less local, but in particular groves it frequently affected 75 per cent. of the crop. The cause of this disease was found to be a fungus, and satisfactory control measures were later developed. Instead of using a fungicide for the control of this disease, as would ordinarily be expected, it was found that spraying with an insecticide had a decided bearing in keeping off most stem-end rot and the appearance of scale insects clustered around the stem or under the calyx of the fruit. By killing the scale or keeping the fruit free from scale at this point stem-end rot could be largely avoided.

Melanose.—This is an old and well-known disease. It is widely scattered over the citrus-growing sections and is responsible each season for much unsightly fruit. The cause was long unknown, and no effective treatment for the prevention of the disease had been brought to light. A few years ago our investigations resulted in the discovery of the cause of the trouble, caused bv the same fungus causing stem-end rot. This fungus appeared in a dual role causing melanose on young tender foliage and immature fruits, and stem- end rot—a typical decay—in the mature or ripened fruits. Melanose injury proved a different type of disease from that ordinarily produced by a fungous parasite. It apparently has a toxic effect on the surface cells of the succulent growth. No development of the fungus in the melanose injury occurred, thus the cause of the disease was completely disguised, as far as the study of diseased specimens were concerned. It was later noted that there was an apparent relationship between dead twigs in citrus trees and the amount of melanose present on these fruits, and when this phase of the subject was thoroughly investigated the cause of the disease was readily discovered. This fungus was known to propagate mainly in dead twigs of branches of citrus trees, becoming a source from which melanose developed. Further study showed conditions under which the foliage and fruit may be affected. In the case of fruits the period of susceptibility was found to extend over several months. This was found to be unfavorable for the use of a fungicide as a means of control, as it would require too many operations of spraying in a season to thoroughly protect the fruit. Attention was then turned to eliminating dead wood from the citrus tree. It was well demonstrated that by systematic pruning melanose might easily be reduced 25 to 50 per cent. It was also found that it was possible to reduce melanose by giving attention to the controlling agencies which caused dead wood, such as scale insects, whitefly, withertip, etc.

Citrus Canker.—This is a disease of recent introduction, and has proved one of the most serious that ever appeared in Florida. Our studies and investigations have been completed in the last few years. The cause was isolated and studied in relation to the effect on the host and its ability to hold over in the soil for long periods. The resistant powers of the organism were also studied at length. The work of the department of plant pathology was of material aid to the State Plant Board in their eradication campaign against this disease in the State.

Foot Rot.—This is an old and well-known disease in Florida found destructive to sweet seedling groves in many sections. Foot rot was recently proven to be a fungus, which seemed common and widely distributed over the State. It attacks plants not related to citrus and belongs to a group of soil fungi whose habits and methods of dissemination are fairly well understood. While a successful control method was developed for foot rot long before the cause was known, the discovery of the cause of this disease helps us to deal with it more effectively.

These are a few of the prominent features of the work done by the department of plant pathology during the past 12 or 13 years. Much more remains to be done of a more or less field nature. The successful completion of the study of citrus diseases on hand will mean much to the growers of the State, and there is need at present for more active work on control measures. It is this study of the problem that is of more or less interest to the growers and one that should be pushed to completion. The more technical, or laboratory, studies are far in advance of the necessary field work to completely round out our problems, and this condition is largely responsible for the long delays in coming to a definite conclusion regarding effective control measures. Owing to the lack of funds and the proper facilities for field work, efforts have been confined mainly to laboratory studies, with the result that the causes of most of the parasitic diseases have been discovered. Their habits and the conditions favorable for their development and distribution are fairly well known. Our problems now is a more intensive study of field conditions in order to work out the practical application of the principles we have found in the laboratory. Such control measures as have been devised should be adjusted to meet local conditions in the field, and it is necessary to test out these measures experimentally in the field for their practical value and in a system of well-planned experiments.

The control of citrus diseases is largely a matter of how the grove is handled, and most of the loss to the citrus grower could be avoided if proper field precautions were taken. The control of scab and melanose are highly important, and if a practical and effective method can be worked out for this purpose, it will mean a saving of several hundred thousand dollars annually to the State.

The decay of fruit in transit is a source of loss each season, and also a problem needing attention. It falls in line, and is really a part of the field work on citrus diseases, since it is well known that most of the agencies causing decay in transit have their beginning in the grove. The United States Department of Agriculture has made a rather thorough investigation of the decay of citrus fruits in transit for several years, and the results of their investigations have pointed out rather clearly that the control of this decay is wholly a matter of careful handling in the field. Blue mold is probably responsible for 75 to 80 per cent. of decayed citrus fruits in transit, and control of blue mold is simply a matter of careful handling of fruit from the time it leaves the tree until it is packed. Stem-end rot and diplodia rot largely make up the remaining important decays, and the control of each is simply a matter of field work.

By a comprehensive study of conditions in the grove for the control of diseases, it seems this would also take care, to a large extent, of any decay that might take place in transit. When we consider the large loss the citrus industry sustains each year by attacks of diseases alone, the urgency for more field work for disease control cannot be questioned.

REPORT OF THE ASSOCIATE PLANT PATHOLOGIST.

P. H. Rolfs, Director.

Sir:—

I submit herewith the report of the Associate Plant Pathologist for the biennium ending June 30, 1920.

Respectfully,

C. D. SHERBAKOFF,

Associate Plant Pathologist.

TRUCK DISEASES.

1. Seed Bed Disease.—Nearly every grower is familiar with these diseases, at least he is fully aware of their importance. Not infrequently an entire seed bed is lost on account of damping off, a very common seed bed trouble; while it is an ordinary practice with the truckers to plant a great deal more of seed bed than they ordinarily need so as to produce enough plants in case of damage by the diseases. Sometimes plants in seed beds are killed outright, in other cases they are stunted in growth or become contaminated with some important field trouble and thus rendered unfit for transplanting.

Our study of seed bed diseases is nearly completed, as we have determined the various causes of typical seed bed troubles (damping off) and the introduction and spread of the trouble. Some practical methods of prevention and checking the development of the diseases are now available. (Common disease of damping off: **Rhizoctonia solani, Pythium debaryaum**, and several species of Fusarium. Some of the fungi are present in new soils, but most of them are either introduced with seed or are accumulated there from lack of proper crops and unsanitary conditions. Poor cultivation, lack of aeration and sunlight induce spread of the disease and vice versa. Soil sterilization, or use of soil free from the fungi, proper cultural methods and, under certain conditions, use of fungicides are the methods of control.)

2. Buckeye Rot of Tomato Fruit.—The disease during certain seasons causes damage amounting to thousands of dollars. It has been familiar to the growers for some time, but was considered caused by too much water. It is, of course, true that the trouble is of great importance only on low lands and during rainy seasons. However, it was found to be caused, not by too much water, but by certain fungus (**Phytophthora terrestria**). At the time, the disease was entirely new to science and later proved of special practical interest, because the fungus which causes this disease is responsible also for foot rot of citrus. At present we find that the fungus occurs in several other States and in many other countries, and attacks a wide range of plants (roselle, lupine, tomatoes, cocoanut trees and castor beans).

After the cause of buckeye rot of tomato fruit was determined, the writer suggested certain methods of its prevention in the field, and of its elimination in shipments. After certain field trials, the method proved practical and effective.

3. Other Diseases of Tomatoes.—Tomatoes are subject to a considerable number of different diseases, which greatly reduce the profits of the crop, and often render their culture entirely unprofitable. While all diseases are not important in every part of the State or during every season, all had to receive certain attention and, as a result of the writer's efforts along this line, a bulletin devoted to this matter has been published by the Experiment Station (Bul. 146).

4. Phomopsis of Eggplant.—Before the writer's work on the disease had been started, it was known that certain fungus, **Phomopsis vexans**, causes considerable damage to eggplants by killing the young plants in the seed bed; by spotting the leaves and fruit, and by causing decay of the stems in the field. However, some important phases of the trouble, such as the "tipover" or "breakover" of the plant in the field, and the manner in which the disease is introduced into new localities, were not known. Because the trouble in many districts was of such nature as to threaten eggplant culture, the writer undertook additional work on this disease. This work showed new phases of the disease and gave us information in regard to the most common way of introducing the disease into a new locality (maybe contaminated seed), so that at present we can easily recognize the disease in all its phases, and also are in a position to give reliable instruction to growers how to keep their fields free from the trouble. (Pure seed and proper crop rotation).

5. Corn Stem Rot.—During certain rainy seasons, May and June, it was observed that many corn fields were affected with stem rot, which often destroyed most of the plants. The affected plants break near the ground as if blown down by a strong wind. The writer found the trouble due to certain soil fungi, and that it can be controlled by keeping the dirt from the immature corn stalks.

6. Pepper Fruit Soft Rot.—In many instances it was observed that much pepper fruit was affected with a soft rot, causing considerable loss to growers. Our study of the diseases showed it was caused by a bacteria which results common soft decay of various fruits and vegetables (**Bacillus caratavons**) and that certain sanitary measures and control of insects puncturing the fruit will remedy the trouble.

7. Irish Potato Late Blight.—During 1919 certain spraying experiments for late blight of Irish potatoes were conducted at Hastings. It was shown that the method of control actually saved the grower, on the forty-acre field where the experiments were conducted, over $2,400. The cost was slightly over $280.

8. Pineapple Wilt.—The growing of pineapples on the lower East Coast up to 1917 had become an important industry. However, due to the great damage done by wilt, the culture was getting to be unprofitable. The writer in his study of wilt has been able to determine that its most

important, if not sole cause, is the eel worm (nematode), the same as produces root-knot on all our truck crops and many other cultivated and wild plants. This finding at once showed us the direction in which to look to control the trouble, namely, proper crop rotation, soil disinfection, whenever practical, and selection and breeding of wilt resistant pineapple varieties.

The funds for the work were extremely limited (from $40 to $80 a year) and, therefore, the writer has been obliged to ask the growers for support. In the minds of local pineapple growers and others interested in the development of the industry, the study of wilt was sufficient to interest them to give about $1,500, asked by the writer for the experiments. The experiments were started last summer and fall (1919), and should be conducted four years longer.

There are several minor studies of various truck crop diseases that have been made during six years of work for this station. Of these minor studies should be mentioned the investigations of seed as disease carriers and how to produce disease-free seed. These investigations have been carried primarily as phases of other problems, such as study of seed bed diseases and of **Phomopsis** of eggplant, and therefore, it was impossible to give the problem the attention it deserves.

The results of this work have been published in annual reports of this station since 1915, in various bulletins and technical papers and in current agricultural literature. Of these publications, special attention may be called to bulletins 139 and 146, which are of sufficient value to be used as references in several universities.

GENERAL ESTIMATE of the ECONOMIC IMPORTANCE of truck diseases, which have been studied by the writer:

1. Seed Bed Diseases.—Assuming that the average loss of plants in seed beds due to diseases is 5 per cent., which would closely correspond to 50 cents an acre of the truck crops grown in the State (tomatoes, celery, lettuce, eggplants, cabbage, etc.); assuming further that of these crops there are 80,000 acres annually; the loss to the State will be about $40,000. The greatest damage from these diseases is that growers are unable to carry out plans as when to plant and how much to plant.

2 and 3. Buckeye Rot and other tomato diseases, especially the different blights and nail-head rust, are responsible for at least 10 per cent. of the crop loss in the State, $500,000 annually.

4. Phomopsis of Eggplant.—I have not had a chance to make an estimate in dollars, but I may state here that the culture of this crop in some districts has been entirely abandoned on account of the disease.

5. Corn Steim Rot.—Probably this is of no great importance. However, our findings as to its cause and control enable us to save the farmer a good portion of his crop (10 to 40 per cent).

6. Pepper Fruit Soft Rot.—Same as above.

7. Irish Potato Blight. During the past 15 years the loss from this disease has been serious in the Hastings district every third year. Each time the disease was responsible for a damage of 20 to 40 per cent. of the crop. A conservative estimate of this damage would be about $100,000 annually for that district.

8. Pineapple Wilt.—This disease has become common in all pineapple-growing sections on the East Coast and threatens the existence of the industry.

The main factors of truck crop diseases in relation to the industry:

1. The presence of many diseases of truck crops renders the industry uncertain. The knowledge of the diseases and how to control them contribute materially to making the industry more stable. In other words, the control of the diseases corresponds to the insurance of the crops.

2. In many instances like that of the control of Irish potato blight and the control of nail head rust of tomatoes the immediate benefits of spraying frequently amounts to ten times as much as the expense incurred in connection with control measures.

3. The total damage caused by various truck crop diseases in the State will amount close to a million dollars a year, much of which could be saved often by simple and inexpensive control measures.

4. There are several lines of work in the study of truck crop diseases which are necessary to undertake as soon as possible. Among these may be mentioned perfecting the methods of controlling tomato nail head rust; producing wilt resistant varieties adapted to Florida; and producing disease-free seed.

REPORT OF THE CHEMIST.

P. H. Rolfs, Director.

Sir:

I submit herewith the report of the chemist for the biennium ending June 30, 1920. The work herein reported was carried out by S. E. Collison, who resigned in March, 1920.

Respectfully,

R. W. RUPRECHT,
Physiological Chemist.

January 1, 1919, saw the close of the 10-year co-operative citrus fertilizer experiment at Tavares in Lake County. A full report of this work has appeared in bulletin 154 of this station.

CITRUS EXPERIMENT GROVE.

The trees have never borne a full crop of fruit, as trees of their age should have done, owing to the prevalence of dieback at various times and to other causes beyond the control of grove management. Therefore it has been impossible to carry on any investigations on that part of the project having to do with a study of the yields and quality of the fruit as affected by the various fertilizers used. However, while this has been a great disappointment, much valuable informbation has been obtained concerning the effects of the fertilizers and various cultural treatments upon the growth of the citrus tree, and upon the composition of the soil. Much light has been thrown upon the questions of the fixation of phosphoric acid and potash by the type of soil used, and of the form in which these elements are retained by the soil. It is believed that the data obtained gives information which may be applied with confidence to similar soils over the State.

A brief resume of the more important conclusions drawn from the data obtained in this work may be stated as follows:

Several sources of fertilizing materials have proven of almost equal value in producing satisfactory growth. Sulphate of ammonia, acid phosphate and high-grade sulphate of potash have proven to be the best materials for this purpose. Nitrate of soda in combination with sulphate of ammonia, steamed bone, floats, hardwood ashes and low-grade sulphate of potash proved good sources of the elements carried by them.

Nitrate of soda has given better results where used in combination with sulphate of ammonia than when used alone.

The use of lime and alkaline materials, such as Thomas slag, has caused some malnutrition, as in the frenching.

The use of kainit as a source of potash has apparently led to slight injury to the trees, shown by the smaller comparative growth made and to a somewhat stuuted appearance of the trees.

Where excessive amounts of the three elements have been used, ammonia has caused more injury than similar amounts of phosphoric acid or potash.

Continuous cultivation throughout the year, while of benefit to young trees, usually should not be continued beyond the fifth or sixth year, as the trees after this age do not appear to make the thrifty growth of the first few years. Such cultivation also leads to much greater loss of nitrogen from the soil.

Both phosphoric acid and potash are retained in considerable quantities in the upper layers of the soil, much of the former being fixed as phosphate of lime.

A study of the nitrogen content in the soils of the different plots brought out the fact that clean cultivation reduced the percentage of nitrogen in the soil by about 65 per cent. from that found where a cover crop was allowed to grow.

A study of the phosphoric acid content of the soils shows that about 70 per cent. of the amount applied and retained in the soil has been fixed in the form of tri-calsium phosphate.

The potash content of the soils has been increased by about 660 pounds an acre, at nine inches deep in the soil. The clean culture plots showed a smaller fixation than did the other plots, indicating that without a cover crop more potash leached out.

SOIL TANK INVESTIGATIONS.

The drainage water from the eight soil tanks has been collected and analyzed as usual. The injury of the trees by the freeze of February, 1917, is still apparent in the increased amount of plant food appearing in the drainage. This injury, by cutting down the amount of leaf surface, has reduced the amount of water lost by evaporation, and more of it has appeared in the drainage, thus leaching out more of the fertiliers.

REPORT OF THE ENTOMOLOGIST.

P. H. Rolfs, Director.

Sir:—

I submit herewith the report of the Entomologist for the biennium ending June 30, 1920.

J. R. WATSON,
Entomologist.

ROOT-KNOT.

Previously reported experiments for eradicating root-knot mematode were continued. Some disastrous results were reported from the use of cyanamid which had been stored for some months. It seems that cyanamid reverts to di-cyanamid in storage and this material is very injurious to plant growth. With fresh cyanamid no such effects extending over a long period of time were noted.

The method of treating the soil with a combination of sodium cyanide and ammonium sulphate was continued. The experiments were so uniformly successful that we are now recommending this treatment. It has been found that 600 pounds is the most economical dosage. The cyanide in solution is applied evenly over the surface of the soil which is then thoroughly irrigated so as to wet it 18 inches deep. Ammonium sulphate at the rate of 900 pounds an acre is then added, as well as a little more water so as to carry the material down 18 inches or more. With this method we found that eradication was nearly complete. Whatever small amount of root-knot occurring on the land was probably due to uneven distribution. In the past year in testing this material in the greenhouse an accumulative effect was noted. Beds that were treated at the rate of 600 pounds to the acre in succession showed markedly the effects of the chemical. Seeds either failed to come up, or they wilted and died after coming up. Some experiments are being tried to see if we can get accumulative effects out of doors where the rains would be expected to wash the material away more rapidly.

Experiments were conducted with summer fallow as a means of eradicating root-knot nematodes. The land was broken in June and cultivated every week and also after every heavy rain until October. This was found to be quite effective in reducing the number of nematodes in the soil, but was hard on soil fertility, leaving the soil very poor, both in plant food and in bacteria.

Experiments are being carried on to determine the practicability of combining this summer fallow method with the cultivation of immune varieties of cowpeas and velvet beans. Brabham cowpeas and velvet beans are planted in rows and kept under constant cultivation, the ground being cultivated at least once a week and after each heavy rain as in the case of the summer fallow. We hope by this means to get as good control of the nematodes as by the summer fallow, and at the same time to avoid the evil effects of that method. Pains are taken to keep the plots absolutely free of either weeds or grass.

THE VELVET BEAN CATERPILLAR.

Study of this insect was continued with special emphasis on possible parasites and effect of the weather during the winter of the following year upon the abundance of these caterpillars. In general it would seem that a severe winter with a kililng frost, extending far down the peninsula, results in such a high mortality of these insects in Florida that their numbers are much reduced the following season. Conversely, an open winter with few frosts, not extending far down the peninsula, is favorable for the rapid increase of the insects the following year. It would seem that the length of time between the first and last killing frost of the winter is the essential factor. As the insect feeds only on velvet beans, kudzu and one or two other plants, all highly sensitive to cold, a heavy frost results in the death of their host plants and, as a consequence, their starvation.

We are now able to predict early in the spring, before planting time, whether there will be much or little injury from this insect during the year. This should be of much importance in determining the former's conduct, for during years of promised abundance of insects only so many velvet beans should be planted as can be adequately taken care of in poisoning these insects.

In addition to the velvet bean caterpillar some attention was given to minor pests of velvet beans. An increasingly large number of insects are adapting themselves to this plant, and as the years pass by this important forage crop will undoubtedly be attacked by an increasingly large number of insect enemies.

THRIPS.

The study of thrips attacking citrus was continued. Apparently thrips were not abundant either year and no spraying for them was done by the department except under co-operative arrangements. In all cases observed the increase in the amount of fruit in the sprayed groves was not great, but the decrease in the amount of scarred fruit was noticeable.

In connection with this study it developed that two other species of thrips are injurious to citrus. One is an undescribed species to which we have given the name "Mason's thrip." This insect is abundant chiefly in the southern part of the State, especially along the lower East Coast. For the first time the Cuban citrus thrips were recognized as being present in Florida, also on the lower East Coast. Although close watch was kept on this insect they did not multiply to any marked extent and the damage done by them was not great.

For the first time thrips were recognized as being the cause of a common trouble with young peanut plants. The tops of the young plants are attacked, blackened and stunted, similar to the injury of tomatoes and other plants of this nature.

Particular attention was paid during the past two years to camphor thrips, as it seemed to be a determining factor to what promised to become a big industry in the State, the commercial growing of camphor trees. In connection with this study the native host plant of the camphor thrips was discovered, namely, wild bay (genus **Tamala**). This work was carried on in connection with the Bureau of Entomology, Washington, D. C. A survey was made of the State to find in what portion bays and also camphor thrips were present. In geenral it was found that few thrips and bays were present on the central ridge of the State from Haines City south to Moore Haven, and although bays were abundant on the lower East Coast no thrips could be found below Cocoa, even on camphor trees which had stood in close proximity to bays for many years. It would seem that thrips are entirely absent from this part of the State.

Fear was felt that this insect might spread to the avocado, which is a close relative of the camphor, but the insect has not been found on the avocado, and an attempt to make it live on the avocado in the laboratory resulted uniformly in the death of the insects. It would seem that the avocado is not a host plant and that it is in no danger from this insect.

Another close relative of the camphor, the lance wood, or **Ocotea,** was carefully investigated, but thrips were not found on the plant and failed to live on it even in the laboratory. A small hymenopterous insect, probably **Cercopid,** was found to be common on this plant and was probably responsible for the reports which had been given out to us for the presence of camphor thrips on Ocotea.

PLANT BUGS.

The study of three species of our larger plant bugs was initiated by an assistant entomologist working in this department. A careful study was made of their life history, parasites and habits with a view of finding a more practical method of controlling them. The pumpkin bug was found to be held in check by parasitic flies. Observation was made on these flies and their abundance throughout the year noted. We found they were about until as late as November or early December and that they were among the first flies to reappear in the spring. These flies were also found to be parasitic on the leaf-footed plant bug and the club-footed plant bug. The leaf-footed plant bug was studied in detail as to life history, etc. It feeds largely upon thistle in early spring and hibernates underneath the thistle in winter. It has a strong preference for sunflowers over most other plants in early spring. By using sunflowers as a trap crop and destroying thistles about the garden, the danger from this insect could be geratly reduced. The club-footed plant bug also feeds largely upon thistles in early spring.

In the fall of 1919 considerable study was given to the cotton stainer. The inroads of the boll weevil in the northern part of the State and the comparatively high price of long staple cotton caused a large acreage of Sea Island cotton in the citrus belt of the State. As a result there was a heavy infestation of cotton stainers in citrus groves. As the cotton matured and became less attractive to the stainers in November the bugs migrated in large numbers to the citrus groves, where they puncture the fruit, particularly tangerines. Their ravages were marked also upon round oranges. As in the case of the pumpkin bug grapefruit was not much troubled. They reached some groves located miles from the cotton fields and could be observed arriving in the grove flying with the wind. They were observed breeding on oranges.

It developed that the pumpkin bug could be controlled by good, strong soap emulsion or paraffin oil emulsion commonly used for combatting whitefly and purple scale. Success was also obtained by using roselle as a trap crop to keep the cotton stainers away from tangerine trees. Roselle was planted near the tangerines and the insects collected on the roselle largely neglecting the tangerines. On the roselle they could be easily sprayed with a strong soap mixture, as any possible burning of the roselle was not considered disastrous.

Considerable effort was made to disribute throughout the State the California whitefly eating lady beetle. **Delaphastus,** and many hundred colonies were sent out. These beetles did much good work in bringing the whitefly under control in several groves in the State. It seems, however, to largely diminish in numbers during winter.

REPORT OF THE PLANT PHYSIOLOGIST.

P. H. Rolfs, Director.

Sir:

I submit herewith the following report of the plant physiologist for the biennium ending June 30, 1920.

Respectfully,
R. W. RUPRECHT,
Plant Physiologist.

The past two years have seen a continuance of the work started during previous years. The work on the potato experiment (outlined in annual report of 1918) has given marked results. The yields of all plots have increased steadily from year to year, showing that the soil on all has improved. A bulletin covering the results of the first three years of this experiment will be published shortly. The results obtained warrant, I believe, the following conclusions:

1. That soluble phosphoric acid is necessary in the early stages of growth to produce vigorous plants.
2. Raw rock phosphates fail to produce maximum top growth.
3. Pebble phosphate in 1920 gave a yield that was nearly as great as from acid phosphate.
4. Soft phosphate has not proven as good as the pebble phosphate.
5. In the absence of sufficient potash, tubers did not reach full size, and, in extreme scarcity, the normal growth of the tops was interfered with and certain appearances characteristic of potash starvation developed.

EXPERIMENTS WITH CITRUS TREES.

The experiments to determine the relative value of acid phosphate, steamed bone, pebble phosphate and soft phosphate were conductd at Lake Alfred in co-operation with the Florida Fruitlands Company and at Lowell in co-operation with the Wetumpka Fruit Company.

At Lake Alfred trees just set out were used in one case, and trees set two years before the experiment was started were used in another case. At Lowell trees 25 years old were used, which had been badly cut back by the cold of 1917.

At Lake Alfred all of trees in both blocks have been making uniform and satisfactory growth. Measurements of the diameter of the trunks has shown that so far as growth is concerned, the different sources of phosphoric acid have had no effect. The older trees are just coming into bearing, and within the next two years any differences the various sources of phosphoric acid may have on the bearing quality of the trees should be apparent. No measurements of the quantity of fruit produced in the

Lowell grove was made up to the time the experiment was discontinued in the fall of 1919, when B. F. Floyd severed his connection as plant physiologist with the Experiment Station. The trees had all made a fairly uniform top growth with no differences apparent between the different plots.

The experiments studying the influences of different ratios of phosphoric acid and potash in complete fertilizers were continued up to the time of Professor Floyd's leaving. The records of yields to fruit are, however, too incomplete to warrant any definite conclusions being drawn. The freeze of 1917 and a severe storm in the fall of 1918 caused the loss of much fruit. No differences in growth or in the quality of the fruit in either grove was perceptible.

REPORT OF FORAGE CROP SPECIALIST.

P. H. Rolfs, Director.

Sir:

I submit herewith the report of the forage crop specialist for the biennium ending June 30, 1920.

J. B. THOMPSON,
Forage Crop Specialist.

THE IMPORTANCE OF FORAGE.

The losses suffered by the livestock interests of Florida through an inadequate and inferior supply of forage can be only partially arrived at by statistical figures. The Commissioner of Agriculture in his fifteenth biennial report lists 8,514 cattle and 2,071 sheep as having "died of exposure to weather." These animals were valued at $159,829, or, in other words, this showed an approximate annual loss to the State of $80,000. If these animals had been given sufficient feed to maintain their health and vigor there is little doubt that most of them could have been saved. Probably a much greater loss to the industry has accrued through loss of flesh, permanent stunting of young stock, and the failure of animals to breed due to weakness. With improved pastures the grade of animals would be improved quickly, and the carrying capacity of the land would be increased, allowing, in some cases, the production of two or more animals where but one is now indifferently maintained.

Figures published by the United States Department of Agriculture in 1915 place the amount of hay annually shipped into Florida at 80,000 tons, valued at $1,344,000. These figures are based upon a price of $16 a ton, whereas Northern and Western hays have cost the Florida feeder more than double that price during the past year. These figures would indicate that more than $2,600,000 of Florida money is annually being sent out of the State for high-priced hay.

EXPERIMENTAL WORK.

Past work along these lines has consited mainly in the testing of new varieties of grass, velvet beans and other legumes. The following grasses, all of which show promise of being valuable for planting in Florida, are some of the developments of this work. It is important that facilities be provided for testing them on a much more thorough and comprehensive scale than in the past.

Napier and Merker Grasses.—These two grasses are coarse growing, cane-like grasses from tropical Africa. They yield heavy tonnage of green feed and can be grown on a wide range of soils in Florida. They are worthy of more extensive study.

Bahia Grass, **Paspalum notatum**, a good pasture grass from South America, is doing well in experimental plantings on a wide variety of conditions. This grass has a densely matting root system, and appears to withstand heavy trampling and close grazing.

Golden Beard Grass, **Chrysopogon monticola**, is a fine stemmed bunchy grass from India, and makes a vigorous growth, providing an abundance of succulent feed, growing especially early in the spring. This grass has been grown at the station for a number of years, and is most promising. It matures good, viable seed in abundant quantities and tests with it should be extended to include tracts of several acres to determine its ability to withstand trampling of animals and its value as hay. Enough should also be planted to furnish a supply of seed for distribution in Florida.

Blue Couch Grass, **Syntherisma digitata**, a bermuda-like creeping pasture grass, introduced from Brazil, promises, from limited data, to thrive on land too dry and sandy for bermuda. It is easily propagated by means of small portions of the sod as is bermuda grass, and can also be grown from the seed.

Vasey Grass, **Paspalum larranyagai**, a South American grass, now found distributed in many parts of the South, is well adapted to low moist soils and furnishes both hay and grazing. This grass and **Chloris distichophylla**, a new tested species of the Rhodes grass group, are the most hardy and cold resistant grasses we have found. Both of these grasses remainnig green throughout the past winter on plots at Gainesville.

PLANS FOR THE FUTURE.

It is very desirable to continue and enlarge upon the work of testing new grasses. With relation to these varieties that have shown special promise as a result of previous work, and which after repeated tests have shown themselves to be adapted to Florida conditions, plantings should be made on a comparatively large scale as soon as practicable. This work should be made to include: (1) planting tests to furnish data on the best methods of planting and cost of establishing a pasture of different grasses on a given area; (2) practical grazing tests with cattle under ordinary farm conditions to determine (a) the palatability or stock preference for different grasses, (b) the carrying capacity or number of animals that can be maintained on a given unit of land when planted to each of these grasses, and (c) to show in a practical way the feeding values of the various grasses by determining the relative production of beef or milk when animals are pastured on them.

Plantings of these promising grasses for the purpose of supplying seed to Florida farmers and stockmen are also desirable at this time. There is much inquiry for planting material of new grasses found to thrive here, and as there is no available market source from which seed can be obtained, it is often argued that the station should be in a position to furnish at least small quantities to those who wish to test these new grasses on their own lands. To render this possible without prejudice to the experimental work additional plantings should be made and maintained expressly for this purpose.

REPORT OF THE ASSISTANT AGRONOMIST.

P. H. Rolfs, Director.

Sir:

I submit herewith the following report of the assistant agronomist for the biennium ending June 30, 1920.

Respectfully,

J. E. TURLINGTON,
Assistant Agronomist.

The work of this period includes a variety test of cotton, a fertilizer test with peanuts and a fertilizer test with sweet potatoes on the station farm; also fertilizer test with corn on the State Farm at Raiford.

COTTON VARIETY TEST.

Nine varieties of upland cotton and one of sea island cotton were chosen from among the most promising varieties in the boll weevil territory. The average yield of the upland varieties in 1917 was 553 pounds, in 1918, 98 pounds, and in 1919, a complete failure. Boll weevil reached us late in the season of 1917, and the experiment was discontinued after 1919. The sea island variety, Sosnowski, gave a yield of 336 pounds in 1917 and 25 pounds in 1918. Cook's improved stood at the head of the list in 1917, with a yield of 726 pounds, and again in 1918 with a yield of 153 pounds. Trice Webber's No. 49 and Mexican big boll were next in yield.

PEANUT FERTILIZER EXPERIMENT.

A fertilizer test with white Spanish peanuts was started in the spring of 1918 to compare the relative effect of soft phosphate, hard phosphate and acid phosphate on the yield of nuts and hay. Dried blood, hydrated lime and ground limestone were also used in the test. The fertilizing materials were applied to the soil a short time before planting the nuts. Corn and velvet beans were planted the following year on the plots to get the residual effect of the fertilizing materials on the corn yield. In 1918 the yield of nuts was good, for our soil, averaging about 1,100 pounds of nuts and about 1,170 pounds of hay an acre. The fertilizers increased the yield on an average about 50 pounds of nuts and about the same of hay. The greatest increase was due to acid phosphate and dried blood combined, which gave approximately 100 pounds an acre. None of the treatments showed paying results. During 1919 the yield was only half of that of 1918, and the average for all fertilizer treatments showed a decreased yield, but this decrease was small. A disease commonly called leaf spot, known as **Cercospora personata**, was severe during this season, causing the leaves to drop before the nuts were mature.

We were unable to get any residual effect from the fertilizers on the corn, which was planted in 1919, following the 1918 peanut crop. The experiment is being continued with the hope that more light may be gotten on the problem of fertilizing peanuts, but thus far we have found no paying results from any treatment tried.

SWEET POTATO FERTILIZER EXPERIMENT.

This experiment was started in 1919 to ascertain the relative value of acid phosphate, soft phosphate and hard phosphate on the yield of sweet potatoes. Dried blood and sulphate of potash were also included in the experiments. The plan includes following the sweet potatoes with peanuts to get the residual effect of the fertilizers on the peanuts. The soil is a very sandy soil, classed by the United States Bureau of Soils as Norfolk sand and by the Florida farmer as high pine sandy land.

The plots receiving dried blood were decidedly greener and more vigorous during the entire growing season. Acid phosphate also increased vigor and improved the color, but to a lesser degree; and potash improved it to a still lesser degree. Those plots receiving hard and soft phosphates could not be distinguished from the unfertilized plots so far as growth was concerned. Nitrogen was the most important single element in increasing the yield, showing an average increase for 10 plots of 1,260 pounds of potatoes an acre, followed by potash with 847 pounds increase, acid phosphate with 572 pounds increase, soft phosphate 300 pounds. Hard phosphate showed a decrease of 325 pounds an acre. All treatments except those containing hard phosphate showed a profit. This experiment is being continued during 1920, and the plots which received dried blood already have a greener and more vigorous appearance.

FERTILIZER EXPERIMENTS WITH CORN ON THE STATE FARM AT RAIFORD.

We have been conducting some fertilizer tests on the State Farm at Raiford, Fla., in co-operation with the State Board of Public Institutions. In 1918 hard phosphate, soft phosphate, acid phosphate, dried blood and potash were used. The plots were very long and narrow, and were about two-thirds of an acre in size. None of the fertilizer treatments showed paying results, the average increase for all treatments beipg about one bushel of corn a plot, or one and a half bushels an acre. In 1919 acid phosphate, nitrate of soda and sulphate of ammonia were used. The average gain from 100 pounds of nitrate an acre was 109 pounds of unhusked ear corn, from 76 pounds of ammoninum sulphate was 94 pounds of unhusked ear corn, from 200 pounds of acid phosphate, 230 pounds of unhusked ear corn. It should be stated that in our experiments on this farm this was the first year that acid phosphate increased the yield of corn, but in previous years it has been used at the rate of 500 pounds an acre and on the lower lying soils approaching the Portsmouth series, acid phosphate decreased the yield. During 1919, however, we had a little higher soil more nearly approaching the Norfolk series.

DIRECTORS' BIENNIAL REPORT OF THE
AGRICULTURAL EXTENSION DIVISION
UNIVERSITY OF FLORIDA.

To the President:

I herewith submit the following biennial report for the period ending June 30, 1920.

A. P. SPENCER,
Acting Director.

The Smith-Lever Act, signed by the President May 8, 1914, and approved by our Governor May 25, 1915, contains the following language: "That the co-operative agricultural extension work shall consist of the giving of instruction and practical demonstrations in agriculture and home economics to persons not attending or resident in said college * * * This work shall be carried on in such a manner as may be mutually agreed upon by the Secretary of Agriculture and the State Agricultural College or colleges receiving the benefits of this Act."

From this it is clear that the Congress of the United States and the Legislature of Florida intended that these moneys should be spent for the benefit of the people not in regular attendance upon the institution. In accordance with the Federal law and State statutes, this work has been developed in Florida with most gratifying results. In addition to the funds which regularly arise from the Smith-Lever Act, Congress has appropriated an additional amount, a portion of which is received by the State to be used in accordance with the same co-operative agreement.

The amount of money available from the Federal Treasury was increased by $10,811.58 over the preceding biennium. For the following biennium the law provides that there will be additional amounts available. The amount this State gets is determined by the ratio the rural population of Florida bears to the total rural population of the United States.

During the 1919 fiscal year some emergency measures appropriated during the war period were carried over. This was used for the employment of county and home demonstration agents, principally for food production work.

LINES OF WORK.

The work of the Agricultural Extension Division of the University of Florida has been conducted according to the requirements of the Smith-Lever Act, which Act forms the basis for all agricultural extension work, and in accordance with projects submitted, adopted and approved by the co-operating agencies.

Ten projects have been undertaken:

Project IA, Administration.
Project IB, Publications.
Project II, County Agent Work.
Project III, Boys' Agricultural Club Work.
Project IV, Home Demonstration Work.
Project V, Animal Husbandry.
Project VI, Home Makers Clubs Among Negro Youth.
Project VII, Hog Cholera Educational and Demonstration Work.
Project VIII, Poultry Husbandry.
Project IX, Plant Pathology.
Project X, Silo Construction.

PROJECT IA, ADMINISTRATION.

This project deals with the administration of the Extension Division of the University of Florida. It provides for office equipment, stenographic and clerical assistance, travel to State and National meetings, supervision of final reports, stationery and all matters of administration and co-operative plans dealing with the policies and direction of the work.

PROJECT IB, PUBLICATIONS.

During the biennium, fifteen bulletins, nine circulars and five posters, two annual reports, 104 issues of Agricultural News Service—were published, and in addition a large number of multigraphed circulars were issued at irregular periods. These publications were distributed from the offices of County Agents and through the mailing list of the administrative offices of the University of Florida. The following is a list of the bulletins issued during this biennium:

Hog Cholera.
Sugar Cane.
Cotton.
Boys' Agricultural Clubs.
Hog Pastures and Feeds.
Spraying Schedule for Citrus.
Farm and Home Makers' Clubs.
The Self-Feeder for Pork Production.
Florida Pastures for 100 Hens.
The Silo in Florida.
Addresses—Livestock Roundup.
Addresses—Citrus Seminar.
Boys' Agricultural Club Guide.
Feeding Beef Cattle in Florida.
Peach Growing in Florida.

PROJECT II—COUNTY AGENT WORK.

During the biennium ending June 30, 1920, funds were appropriated on Project II, providing for the services of a county agent in thirty-five counties on a co-operative basis. County appropriations are required in each county to supplement these funds. These additional appropriations are provided from county funds, principally by board of county commissioners.

The county agent usually has headquarters at the county seat. His work is planned so that direct benefit will come to the farmers of his county. A summary of agents' activities follows:

Visits made by county agents	67,174
Miles traveled	502,490
Calls on agents relative to work	62,961
CORN—	
Number of farms conducting demonstrations	643
Total acreage grown under demonstration methods	6,453
Average yield an acre	25.8
COTTON—	
Number of demonstrations	62
Number of acres grown	308
Yield an acre in pounds	1,755
SMALL GRAINS—	
Number of demonstrations	144
Number acres pastured or cut for hay	941

LEGUMES AND FORAGE CROPS—

Number of demonstrations	1,068
Yield an acre of hay (tons)	2.4

SWEET POTATOES—

Demonstrations	371
Total acreage grown by demonstrators	2,067
Estimated increased acreage	3,994

IRISH POTATOES—

Demonstrations	157
Total acreage grown by demonstrators	588
Estimated increased acreage	1,014

FRUITS—

Demonstration groves	8,766
Total number of trees in demonstrations	2,513,479

Groves inspected	1,757;	trees inspected	3,830,464
Groves pruned	689;	trees pruned	899,295
Groves sprayed	552;	trees sprayed	726,935
	2,998		5,456,694

DAIRY CATTLE—

Purebred dairy cattle introduced through county agents' influence:	
Bulls	81
Cow	893
Cows tested for production	413
Farmers induced to feed balanced rations	662
Cattle fed	2,644
Demonstrations in dairy work supervised	38
Cows in these demonstrations	53

BEEF CATTLE—

Purebred beef cattle bought through agents' influence:	
Bulls	227
Cows	698
Grade cows introduced for breeding purposes	266
Beef breeding herds started	31
Feeding cattle introduced	688
Beef feeding demonstrations	4
Cattle fed	363
Estimated number beef cattle handled according to methods advocated by county agents	1;654

HOGS—

Purebred hogs brought into State due to county agents' influence:	
Boars	461
Sows	2,244
Extra head purebred and grade sows bred	1,820
Hog feeding demonstrations supervised by county agent	262
Number of hogs	1,735

Farmers induced to grow grazing crops for hogs	13,586
Estimated number of hogs cared for according to methods advocated by county agents	26,186
POULTRY—	
Poultry demonstrations	328
Poultry cared for according to methods advocated by county agents	70,025
Farms on which poultry management has been improved	777
Number of birds on these farms	18,670
LIVESTOCK DISEASES—	
Number farm animals extension workers induced farmers to have treated for diseases and pests:	
Cattle	74,725
Hogs	36,443
Horses and mules	588
FERTILIZER—	
Farmers advised regarding use of fertilizers	9,178
Fertilizer demonstrations	506
Tons of fertilizer used	5,067
Communities buying fertilizer co-operatively	112
MANURE—	
Farmers induced to take better care of manure	1,506
Number providing sheds	313
Number composting farm manures	981
Manure spreaders purchased by demonstrators	223
Farmers mixing raw phosphates with farm manure	768
Estimated quantity of farm manure saved (tons)	101,220
SILOS—	
Silos built in State	79
Number built as result of county agents' advice	33
Number of silos now in State	742
LIME—	
Farmers using lime due to county agents' influence	110
Quantity of lime used in tons	233
Number of acres limed	989

Many dipping vats and silos are being built in all parts of Florida, and while the construction of dipipng vats is under the supervision of the Livestock Sanitary Board, county agents have given this work substantial support and are directly responsible for the large number that are being built.

Each county agent is supplied with an office, and tabulated results show that county agents spend 75 per cent. of their time on farms and 25 per cent. attending to office duties.

PROJECT III—BOYS' WORK.

While the boys' club work is arranged under a separate project, the organization of the clubs is very largely in the hands of county agents, who consider it an important part of their work.

The following is a brief summary of the corn club work in Florida:

Total number of boys enrolled	1,805
Total number of boys reporting	473
Average number of bushels an acre	35.6
Average cost a bushel	.488
Total number of bushels produced by club boys	16,754

One boy in Hillsboro County made over 100 bushels of corn to the acre in 1920.

During this biennium, 2,333 boys were enrolled in pig clubs and 333 in peanut clubs. In addition to this 314 boys were enrolled in the various other clubs mentioned above.

CLUB CONTESTS.

At the close of the crop season club contests were held, wherein the boys compete for prizes awarded to corn, pig, peanuts and miscellaneous clubs. At these contests the farmers are also invited. Frequently these contests are held in connection with the girls' club contests, and it is at these contests that the club members are selected for the short course at the university.

CLUB EXHIBITS AT FAIRS.

The successful club contestants send their products to the State and county fairs, making it possible to have an elaborate display of corn, peanuts and hogs. The Fair Association award prizes, which prizes go to defray the expenses of these exhibits, and to pay premiums awarded. The arrangements for the State Fair is in the hands of the Boys' Club agent.

BOYS' SHORT COURSES.

The successful contestants in the boys' clubs of the different counties are awarded scholarships to attend the short course prepared especially for these boys on the campus of the university. A week's instruction is given by members of the agricultural faculty and the Experiment Station. This instruction consists of some classroom work, but more particularly laboratory and field exercises.

The expenses of these boys are paid from prizes awarded by various fair associations, appropriations from county commissioners and by scholarships supplied by commercial organizations and railroads. The boys are divided into groups, and these are assigned to definite instruction. During the biennium 206 boys have attended these short courses.

PROJECT IV. HOME DEMONSTRATION WORK.

The home demonstration work has been carried on in 35 counties in each year of the biennium. The allotment of funds for this work is on the same basis as the county agents; that is, in each county where an agent is employed, the county appropriates a supplementary fund sufficient to employ the services of agents, thereby forming a co-operative arrangement between the counties and this division.

The most important accomplishment was the work secured through girls' clubs. The canning and preserving of garden crops for home needs has been emphasized. Other activities have been the conducting of short courses for the girls, the display of home demonstration products at the State and county fairs and contests, organization of women's clubs, women's short courses, summer school instruction for home demonstration agents, and the application of improved methods in canning and preserving.

Below is a statistical report of some of the work accomplished:

Number of girls enrolled	8,756
Number of women enrolled	12,466
Total number of containers filled	1,933,050

Under this project 11 bulletins have been published. These and additional bulletins from the United States Department of Agriculture have been supplied through the offices of the State and county home demonstration agents.

POULTRY CLUB WORK.

The poultry club home demonstration work, under the supervision of Miss Minnie Floyd, has functioned effectively. The poultry work is not designed especially to encourage commercial poultry raising, but to improve the quality and production of poultry products on the average farm.

The girls' and women's poultry clubs have been organized under the direction of State leaders.

Particular attention is called to one egg circle that sold 10,851 dozen eggs during one year, and for which they received $5,267.54. In addition to this they sold 7,491 pounds of chickens and turkeys, which amounted to $2,440.39, or a total of $7,707.93.

HOME DAIRY WORK.

The home dairy work, under the supervision of Miss Mae Morse, has been under way since the beginning of the biennium. This is conducted on the same plan as other projects with women and girls. The supply of whole milk, under average conditions, is far below actual needs, particularly to rural families. On many farms where dairy cows are not kept this reflects directly on the health of the children.

The instruction given by Miss Morse has been principally in the proper use of dairy products, also to encourage families to secure a better grade of dairy cattle and improve them by various means at their command. Records have been kept of the production of individual cows and herds, thereby enabling owners to weed out unprofitable ones.

The effect of this work is shown strikingly in two cases where co-operative dairies are now in operation, and attributing a large part of their success to the work done by home demonstration workers, under the leadership of the agent in home dairy work.

To encourage this work, bankers, business men and others have contributed liberally to prizes awarded at State and county fairs, and to exhibits calling attention to the importance of home dairy work.

PROJECT V. ANIMAL HUSBANDRY.

In Project V two main divisions were considered. The most important was improvement of beef cattle through co-operative agreement with the Bureau of Animal Husbandry, United States Department of Agriculture. The beef cattle specialist in Florida has worked principally through the supervising and county agent forces to improve in every possible way the beef cattle industry of Florida.

The first undertaking was the introduction of pure-bred cattle from outside of the State. Most of these came from Texas, as they could be procured within the tick area, and were safe to place on Florida ranges. Several carloads were purchased by the stock interests in the State through the efforts of the specialist, until now the beef cattle has been increased about 50 per cent. over the preceding biennium. A recent report of the beef cattle specialist shows he has reviewed the following pure-bred cattle:

Aberdeen-Angus	1,272
Hereford	1,362
Shorthorn	755

The beef cattle specialist gave much time to the distribution of pure-bred and grade-breeding stock within the State, thereby preventing many aged-breeding animals from being slaughtered that were still useful as breeders, and saving them to the State. In some instances this was done by interchange.

The beef cattle specialist prepared a want list of livestock on tabulated sheets. This list was furnished monthly by breeders and passed through the State, thereby keeping breeders in touch. This work also carried out some feeding demonstrations, principally with Florida cattle and Florida feeds. Four demonstrations were conducted during the biennium. These were principally with range cattle placed in lots, being fed from 90 to 100 days on balanced rations, with accurate weighings of the animals and the feed and the cost a pound of gain recorded and placed in the hands of the feeder. Due to fluctuating prices of feeds, these showed varying returns. In most cases a comparatively small profit was made on account of high price of cottonseed meal and other concentrates. The beef cattle specialist supervised the weighing, made visits to the feeding lots and conferred with owners on the work.

FORAGE CROP SPECIALIST.

The second important division under this project was the work of the forage crop specialist. This was carried through a part of each year. The arrangements being that the specialist give part time to experiment station work. The forage crop specialist, who had made a study of native and introduced forage plants and grasses of Florida, visited and worked with county agents. The agents placed him in touch with feeders and farmers desiring to improve their native pastures and grow forage crops. He encouraged the use of silos and other means of providing a more liberal supply of feed stuff during the entire year.

The cattle interests of Florida represent a total number of about a million. Over 90 per cent. of these are under range conditions. The feeding of these in lots is not practicable. The great problem that lies before the owner of such cattle is to improve the range, and in this interest the forage crop specialist has visited these principal grazing areas, studying the grasses, means of improving them and the possibilities of improving other cultivated grasses.

While making this study, notes were taken on the different native grasses that enter into the flora of the grazing lands, and wherever possible herbarium specimens are taken for future reference and properly filed in his office.

The work of this specialist has been distributed over the whole field of livestock and forage crops. This is particularly true with the forage crop specialist in that he has given careful study to pastures, soiling crops, production of hay and silage.

He has also given liberal assistance when called upon at State, county and community meetings where county agents had assembled farmers for agricultural instruction.

PROJECT VI. NEGRO EXTENSION WORK.

The work has been conducted under farm and home makers' clubs. These clubs were organized by A. A. Turner, local district agent, who has headquarters at the Florida A. & M. College at Tallahassee. The negro work is conducted on a co-operative basis with the Florida State College for Women, the University of Florida and the Florida A. & M. College for Negroes at Tallahassee. Local county or home demonstration agents are employed in counties having a large negro farming population. This work is under the immediate direction of the local district agent, and these assistant agents submit their weekly reports to the county and home demonstration agents in their respective counties. These local workers receive their instructions through the State agent, who supervises the work and supplies them with literature, pamphlets and suggestions, and who assists them with short courses and in other various ways. This work also includes home demonstration work among negro women and girls, principally to encourage thrift and make better homes. Conservation of food products, the proper kind of clothing to wear and instruction in sanitation.

The problems and accomplishments may be briefly stated and summed up as follows:

Better cultural methods taught through field and garden plots and a better understanding of the modern cultural methods of farming by labor-saving machinery.

Selection of field and garden seeds.

Farm and home conveniences.

Farm and home improvements, including better sanitary conditions.

Control of hog cholera.

Farm makers' clubs, including pig, poultry and savings.

The total number of club members for the biennium was 3,845, with 1,875 reporting. The total number of demonstrators enrolled was 1,308, with 510 reporting.

CORN CLUBS.

Number of Acres Planted	347
Average Yield to the Acre (Bushels)	33
Average Cost of Production	.355

SWEET POTATO CLUBS.

Number of Acres Planted	217
Average Yield to the Acre (Bushels)	92
Average Cost a Bushel	.24

PEANUT CLUBS.

Acres Planted	173
Average Yield to the Acre	29.5
Average Cost a Bushel	.25

PROJECT VII. HOG CHOLERA EDUCATIONAL AND DEMONSTRATION WORK.

The educational work in hog cholera control has been continued. The effect of this is marked in every locality in Florida. It is now an unusual thing that stock owners attempt to raise hogs without applying preventive treatment. As this preventive treatment requires practical skill and knowledge of diseases, the specialist in hog cholera educational work has given his time to county agents in the field, visiting farmers, looking over their herds, making observations as to sanitation, giving instruction as to the use of serum, prevention and spread of the diseases. As practically every county in Florida has been menaced with hog cholera at various times, this has proven a profitable line of work.

The agent in charge traveled principally by auto, going from county to county and visiting farmers on the way.

This work was conducted in co-operation with the United States Bureau of Animal Industry. The literature and supplies were furnished jointly by the co-operative agencies.

On July 1, 1920, the Bureau of Animal Industry withdrew their support to this project, making it necessary for it to be discontinued. However, county agents had been thoroughly instructed by this specialist and are now well qualified to carry it on.

PROJECT VIII. POULTRY HUSBANDRY.

The work in poultry husbandry in the University of Florida is just beginning. The extension poultry husbandman has given half of his time to teaching and half to extension work in the field. This has been inadequate to supply actual needs, but enough has been accomplished to indicate that the work is one of the most important undertaken.

This work has been carried out principally in co-operation with county and home demonstration agents. By arrangement the specialist visits the agent in touch with persons interested in poultry.

The work was principally to improve the small poultry flock on the average farm rather than to encourage or promote large poultry plants. A general survey indicated the quality of poultry in Florida to be comparatively low, compared with that of better developed poultry states. That made a wide field for an active specialist.

The general plan of the work was: First, the introduction of better poultry by any means available; second, the proper management and feeding of laying fowls; third, the management and care of little chicks; and, fourth, lending encouragement to breeders, giving them information that enables them to buy the kind of stock most useful under average conditions.

The poultry specialist's work with county agents has also been extended toward getting up poultry shows, thereby stimulating competition. These poultry shows were usually held in conjunction with a poultry extension school, where breeders were asked to bring a few birds together and spend one or more days in conference over the quality of these birds and under what conditions they would become most profitable. The extension poultry husbandman has worked co-operatively with home demonstration agents, and particularly through the poultry specialist in home demonstration work, assisting her with the poultry in the hands of club girls and women, making selection for show birds, assisting these clubs in securing pure-bred poultry and eggs for breeding purposes, and lecturing at poultry short courses to girls and women.

Another important service rendered by the extension poultry husbandman has been the conferences with prospective poultry breeders, many of whom are from other states and desire accurate information as to the best methods in starting out to raise poultry profitably.

PROJECT IX. PLANT PATHOLOGY.

During the biennium the agricultural extension division has given assistance to plant pathological problems, as its affects particularly the truckers. During the early part of the biennium the extension pathologist was employed in co-operation with the United States Bureau of Plant Industry. This specialist gave his time principally to emergency problems, and responded to many calls where truckers found their crops infected with diseases threatening to destroy them. Through the medium of the county agent, these specialists were enabled to reach the farmers or growers without delay and advise them in the best methods of control or management of the diseases in question. This work was particularly active between February and at the end of the biennium, as that is the most favorable time for the development of truck diseases and when the greatest amount of truck crops are being marketed. Due to the inability of the Bureau of Plant Industry to continue their co-operation, this part of the work was withdrawn July 1, 1919.

CONTROL OF WATERMELON ANTHRACNOSE AND STEM-END ROT.

The work of the specialist in watermelon diseases has extended over a very large area of Florida, though confined principally to the area producing the earliest melons. The production of watermelons has been governed to a large extent by the possibility of controlling diseases and insect pests. During April and May the watermelon specialists were active in assisting growers in the control of anthracnose. As the crop is grown on a large scale, it is a big undertaking to attempt to control these diseases, unless the attempt is made in time. By proper spraying anthracnose can be checked in its stages. Various recommendations are necessary, depending on conditions. The most successful spraying operation conducted was on a farm in Marion County, where the grower successfully sprayed 400 acres every ten days throughout the season, even up to the time the melons were being shipped. These melons were 20 per cent. above the average in size and sold at a premium because of their fine quality. The cost of spraying these melons depends on conditions, but ranges from 60 cents to $1.50 an acre. Where the machinery was modern and the equipment properly constructed for the handling of the work, the cost in each case was less.

STEM-END ROT TREATMENT.

During the shipping season the principal work of the watermelon specialist was in treatment of stem-end rot of watermelons. Due to a ruling made by the railroads that every shipment must be prepaid unless treated, the specialist worked co-operatively with the railroad agents, visiting sections where shipments were in progress, instructing the buyers and farmers how to apply the paste and giving them full information as to its value. It was impossible for the specialist to be in all sections during the shipping season. However, by advising farmers in advance, and by keeping in touch with buyers and others influenced in having this work done, it is estimated that 85 per cent. of all the melons shipped from Florida during the biennium have been treated for stem-end rot. During the first year of the biennium it was possible through the co-operative arrangement to check up the results of this treatment. Cars were marked and inspected in Florida and again at destination. Market inspectors' reports were received at New York, New Orleans, Detroit, Pittsburg, St. Louis, Denver, Seattle, Minneapolis, Providence, Philadelphia, Baltimore, Chicago and Cincinnati. One car in Minneapolis showed a 4 per cent. decay in treated melons and a 28 per cent. in untreated. A summary of all cars going to various Northern markets showed on the average one per cent. loss from treated melons, whereas the untreated cars that were inspected showed over 35 per cent. decay. General market reports show various losses from 8 to 70 per cent. decay, and usually from causes that are preventable by proper treatment and handling of melons before they left the shipping point.

PROJECT X—SILO CONSTRUCTION.

This work was undertaken for a short period during the last three months of the fiscal year ending June 30, 1919. The silo specialists prepared blueprints, estimates and other information needed by farmers when attempting to build silos. Through the medium of the county agents he was placed in touch with those proposing to build. He spent the necessary time with farmers, used these plans and blueprints, gave estimates of the cost of construction and the capacity necessary for the stock on hand, and advised regarding ensilage cutting machinery, etc.

As a result of this campaign a few silos were constructed. However, the increased cost of building material, labor, etc., made building prohibitive on the part of many who had contemplated doing so. Perhaps the greatest good was in assisting farmers to build silos of the proper type and size.

Those building silos and filling them were given additional assistance when the time of filling arrived and still later by the beef cattle and forage crop specialists when the silage was being fed to livestock.

Finally a summary of the activities of the extension work shows a wide range of activity as carried out under various projects. These activities in each case are directed to a large extent through the county and home demonstration agents, they being the connecting link between the farmers and the College of Agriculture as well as the United States Department of Agriculture. In carrying out these projects it has been the policy to enlist co-operation from every source where assistance could be given. Florida cattle raisers, swine breeders, poultry associations, agricultural fairs, commercial clubs, members of boards of trade and others interested in things of an educational nature, have given active co-operation to agricultural extension work.

The press of the State has been liberal in space on all occasions. Various officials of the United States Department of Agriculture and of the College of Agriculture, aside from extension work, have given every possible assistance in the way of instruction when called upon. The co-operation between the College of Agriculture and the Florida State College for Women has been important to the work and has worked to a good end in most counties. The work of the county and home demonstration agents is so closely allied that they cannot be separated, and it is necessary that plans mapped out by supervising agents be of such a nature as to insure the greatest co-operation.

CHANGES IN STAFF.

On January 1, 1919, William Gomme was appointed district agent for South Florida in co-operative demonstration work. He resigned June 30, 1919, and was appointed county agent in Polk County.

R. W. Blacklock, emergency assistant club agent, resigned July 31, 1919, and was appointed county agent in DeSoto County. On September 15, 1913, he was reappointed assistant club agent. L. R. Highfill, assistant club agent, resigned September 15, 1919.

At the close of the college year Frazier Rogers and J. E. Turlington, of the College of Agriculture, were appointed as silo and agronomy specialists. On June 30, 1919, both positions were discontinued on account of lack of funds.

J. M. Scott, animal industrialist of the Experiment Station, was appointed animal industrialist of the Extension Division.

A. P. Spencer, vice-director, was assigned to the duties of district agent in South Florida, in addition to regular duties at headquarters.

W. N. Ankeny was appointed extension plant pathologist, beginning his duties March 1, 1919. This work was discontinued June 30, 1919.

M. L. Benn and C. M. Tucker were appointed extension plant pathologists to work principally on watermelon diseases. Their work began April 4, 1919, and continued to June 30.

J. O. Traxler, farm help specialist, resigned June 30, 1919. As Mr. Traxler was employed as war emergency specialist the position was discontinued June 30.

Miss Agnes Ellen Harris, State home demonstration agent, resigned June 1, 1919, to engage in Smith-Hughes work in Texas. The position was filled by the appointment of Miss S. W. Partridge, district agent for South Florida.

On July 1, 1919, Miss Harriette B. Layton, district agent of North and West Florida, was appointed assistant State home demonstration agent.

Miss Lonnie Landrum, assistant district agent, was appointed district agent for West Florida but resigned September 1 to pursue graduate studies in Columbia University and was succeeded by Miss Lucy Cushman, emergency city worker from Miami.

Miss Sara D. Griffin was appointed assistant district agent home demonstration work for Middle Florida, October 1, 1918, but resigned June 30, 1919.

G. L. Herrington resigned as State boys' club agent on February 15, 1920, having been elected to a similar position in the agricultural extension work in Tennessee.

R. W. Blacklock, formerly assistant club agent, was promoted to State boys' club agent February 15, 1920.

E. F. DeBusk, a former county agent, was appointed assistant club agent, succeeding Mr. Blacklock on April 1, 1920.

Miss S. L. Vinson, agricultural editor, resigned May 10, 1920, and was succeeded on July 1, 1920, by Ralph Stoutamire, an agricultural graduate of the University of Florida.

Miss L. R. Hunter resigned July 1 as assistant auditor and was succeeded by Miss Retta McQuarrie.

W. H. Black, extension animal husbandman, working co-operatively with the United States Bureau of Animal Industry, resigned June 1, 1920.

A. H. Logan, in charge of education and demonstration work in hog cholera control, co-operating with the United States Bureau of Animal Industry, resigned July 1, 1920.

DEAN'S BIENNIAL REPORT, COLLEGE OF ENGINEERING,

UNIVERSITY OF FLORIDA.

To the President:

I respectfully submit the following report from the College of Engineering of the University of Florida. This report has been prepared in collaboration with the Faculty of Engineering, and has its approval.

GENERAL SITUATION IN THE COLLEGE OF ENGINEERING.

The general situation in the College of Engineering is one of extreme embarrassment due to the utter inadequacy of the teaching force and equipment to care for the largely increased number of students. The enrollment this year has been 149, but the regular teaching force authorized was smaller than in 1915, when the enrollment was only 49.

The situation has been met, as far as possible, by the following emergency measures:

1. By seriously overloading the teaching force of the Engineeeing College, thus sacrificing quality of instruction to quantity.

2. By omitting certain of the less fundamental technical courses, and requiring the students affected to take general electives instead; thus graduating them without instruction in some subjects which technical graduates are expected to know, and which those from other colleges do know.

3. By calling on eight members of our senior and junior classes to help as student assistants in instructing the lower classes; a task which they undertook with splendid spirit, but, of course, without experience or adequate training; with the result that, through no fault of the student assistants, the lower classmen did not receive as good instruction as they had a right to expect. Following the Christmas holidays, funds were provided from the general emergency fund of the university to employ two part-time regular instructors in the College of Engineering, thus releasing three of the student assistants.

The equipment, as well as the teaching force, has been inadequate for our present enrollment. The appropriations for new equipment in the four-year interval, 1915 to 1919, were less than $5,000, and for current supplies and upkeep of equipment, about $1,000 per annum, so that depreciation has not been well taken care of, and the present equipment is hardly equal to that of 1915, either in quantity or condition.

An unusually large number of freshmen have dropped out during the year, presumably because they have not received as good instruction as previous freshmen classes. A specially deplorable, though natural, result of the overloaded condition of our facilities, has been the considerable number of accidents in the university shops, in which accidents hardly ever occurred in previous years.

A circular letter was sent out last Fall to all High School principals in Florida and to the leading newspapers announcing that in the Fall of 1920 the College of Engineering would be unable, owing to insufficient provision of facilities, to admit more than fifty freshmen. As a result, some thirty applicants (up to this writing) have informed our office of their expectation to enter the College of Engineering as freshmen next Fall and have paid the registration fee for next year. This measure will not in the least relieve our present embarrassment next year, since the number in the sophomore and upper classes will be larger than ever before. It will merely prevent the present congestion from becoming much worse, and as the present condition is a quite impossible one it will become necesasry in later years to limit the freshmen admitted even more, unless added teaching force, which has been asked for so many times, is actually provided.

It is superfluous to state that our engineering students under these conditions are not getting the instruction to which they are entitled.

and which they must have in order to equip them for competition in later life with tecnnical graduates from other institutions.

As you know, I have striven for years to prevent the possibility of such a breakdown as has occurred. Recommendations for increased teaching force have been made year after year, but without result; and when it appeared that the necesasry facilities would not be available for this year I requested at the university office in June, 1919, that in correspondence with prospective students it should be stated that the university was not equipped to admit more than fifty engineering freshmen as the extreme limit; but this was not heeded, and more than eighty arrived in September.

GENERAL STATEMENT OF PROGRESS SINCE THE LAST BIENNIAL REPORT.

ENROLLMENT.

The number of students enrolled in the College of Engineering was 149 for the year 1919-20, of whom 14 were seniors, 18 juniors, 26 sophomores, 82 freshmen and 9 special students. All were of college grade, meeting the university entrance requirements (although not always without conditions) except eight who were admitted as "adult specials."

LIMITATION OF ENROLLMENT.

As mentioned above, general announcement has been made throughout the State that not more than fifty freshmen will be admitted in engineering next Fall. This has been absolutely necessary, not to relieve the present congestion, but to prevent it from becoming worse. If the present demand for engineering instruction continues, it will, of course, be necessary to continue the limitation of enrollment, unless the present teaching force should be very greatly increased—in fact, nearly doubled, since the present enrollment is three times what it was when the present size of teaching force was organized.

Much can be said in favor of limitation of enrollment as a permanent policy. It would make it possible to admit only the abler and more serious students, thus relieving the State of the expense of trying to educate some who are incapable of success in higher studies or in the professions to which these studies lead. On the other hand, it would seem more in line with democratic institutions not to place a limitation on numbers, but to admit all who can show the necessary preparation. The choice between these two policies is one for the State to make by the sort of appropriations it provides; whether sufficient to take care of the increasing numbers of students or not.

FACULTY.

My biennial reports have usually mentioned every change in personnel of the Engineering Faculty, but the changes in the last two years have been too numerous to permit doing this. For example, the department of civil engineering has been in charge of three different men during the college year of 1919-1920. The changes have been due to the ease with which much greater pay can be obtained elsewhere than at the Univrsity of Florida. In all cases we would gladly have retained the services and experience of the men who were leaving us. It is becoming increasingly difficult to fill the places left vacant with men of the training, character and experience that our students are entitled to have for instructors.

DEGREES CONFERRED.

Since the last report, degrees have been conferred in 1919 and 1920 as follows: C. E., 1; M. E., 1; B. S. C. E., 6; B. S. E. E., 9; B. S. M. E., 4.

DEMAND FOR OUR GRADUATES.

For the last two years the demand for our graduates to fill technical positions has exceeded the supply. Many of the large manufacturing concerns of the North invite out graduates into their employ and send representatives here to interest our students in their companies.

Florida employers appear, as a whole, to take less interest in our work than those of the North, but are employing our engineering students with increasing frequency.

In 1916 I started the custom of sending out a circular letter to possible Florida employers about the middle of May, asking about opportunities for summer employment for our technical students. These letters have brought large response, so that we have not always been able to find enough men to recommend for the openings brought to our attention. It is my hope that eventually such relations can be established with Florida industries that certain ones will make definite arrangements for taking a few engineering students into summer employment every year, as many industrial companies in the North do. This might make it possible to guarantee the students summer employment, and to secure for them and for the industries some of the benefits of the co-operative system of engineering education, which has been so advantageous in the larger industrial cities.

ADDITIONS TO THE ENGINEERING BUILDING

Completion of the Third Story.—In the summer of 1918 the previously unfinished third story of the Engineering Building was completed, and the physics department was moved to it from its former quarters in

Science Hall, leaving those quarters available for the expansion of the chemistry department. This change provided for both the physics and chemistry departments approximately twice the floor space that each had had before, and has greatly increased the efficiency of both departments and the number of students that can be taught in them.

South Wing.—In the summer of 1918 a one-story wing, 40 feet by 180 feet, was built south of the Engineering Building, to accommodate shops for wood working, forge work and foundry. The appropriation made for this was intended to include enough for equipping these shops; but the increased cost of building absorbed all the appropriation in the bare building, and nothing was left for equipment. This space has accordingly been unused except that a part of it has been found convenient for temporary storage of the supplies belonging to the military department. The College of Engineering has had to continue using its small, wholly inadequate shop equipment, much of which was inherited from the old Florida A. & M. College at Lake City fifteen years ago. Naturally much of this machinery is obsolete, worn out, and even unsafe.

These changes have approximately doubled the floor space in the Engineering Building, but my recommendation to make provision in the university budget for the care of the additional space has not been followed. To meet the emergency, the none-too-large funds for the current expenses of the laboratories were drawn on to provide the necessary additional janitor service.

UNIVERSITY OF FLORIDA ARMY SCHOOL

In the spring of 1918 the University of Florida complied wtih the request of the War Department to use its facilities and organiation for the vocational training of enlisted men as skilled workmen in various trades. This work on behalf of the university was intrusted to the College of Engineering. The first detachment of enlisted men, numbering 286, arrived on June 15 and left on August 13, making room for the second detachment of about 367, which stayed until about the middle of October.

The cost of instruction, board and lodging for the first two detachments amounted to about $60,000. This was met by payments from the War Department, according to contract with it calling for a fixed payment per man per day. The enterprise was so managed that expenes came within the contract price; the quality of work being such that the supervisor from the War Department gave it the "A," or highest rating.

According to contract with the War Department, more detachments were to have come at the middle of October, December, February and April, respectively; but on account of the influenza epidemic, the third detachment was not mustered; and as the armistice was signed soon after it should have arrived, the whole plan was discontinued. Relying on the contract, considerable expense had been incurred in accumulating special equipment for the third and later detachments; but the Government abrogated its contract on account of the discontinuance of the war. After long delay, a special agent was sent here who adjusted the affairs by payment of a lump sum to reimburse the university for the actual expenses it had incurred on this contract.

REHABILITATION OF SAILORS AND SOLDIERS.

Of the disabled soldiers sent to the University of Florida by the Federal Board for Vocational Education, several are taking all of their work in the College of Engineering. A number of others are making use of certain departments in the Engineering College, especially drawing and mechanic arts, without taking the regular engineering courses. It is a great satisfaction that the College of Engineering is proving useful in the work of rehabilitation of those who have suffered in defense of the nation.

NEEDS.

NEED FOR LARGER TEACHING FORCE.

The teaching duties required from the faculty here have always been heavier than in most American colleges, with the result that we are prevented from giving as good quality of instruction, since we have less time to keep ourselves informed on current progress in our specialties, or to carry on work of research, authorship or lecturing, which are usually expected from college professors. Our students are entitled to have instruction of the best quality and should not be prevented from receiving such instruction which is made impossible by overworking the instructors as at present. The inadequate teaching force hitherto provided has, of course, had absolutely no reserve capacity for emergencies, so that with the unexpectedly large enrollment this year, it has not been able to meet the situation properly; but use has had to be made of a large number of student assistants; and some courses which were announced in the catalogue have not been given at all. In many subjects the students have had to be taught in larger groups than is best, especially in shops and laboratories. The unusually large number of accidents in the woodshop, where we have had hardly any in the past, is largely due to crowding too many students into the shop at one time, which would not have been necessary if sufficient instructing force had been available to take the classes in a larger number of sections.

It will not be possible to carry on the work of the Engineering College with its present enrollment—to say nothing of providing for expansion—without the employment of four additional full-time teachers, who should be assigned as follows: One assistant professor of mechanical engineering; one assistant professor of mechanic arts; one instructor in physics; one instructor in drawing.

NEED FOR PROPER SUPPORT OF NON-ENGINEERING DEPARTMENTS USED BY ENGINEERING STUDENTS.

The greatly increased enrollment of students has not only overloaded the engineering departments of instruction, but also the departments of mathematics, English, chemistry, and others, which are accredited primarily to the College of Arts and Sciences, but which give instruction to engineering students as well. The congestion in some of these departments has been even worse than in the engineering departments, with corresponding failure to give the students the attention and instruction they have a right to expect. It is urgently necessary, from the point of view of the Engineering College, as well as that of the Arts and Sciences College, that all of these departments should be strengthened and provided with sufficient teaching force to give attention to the students who come to them for instruction.

The course in geology, formerly required of civil engineering students, has had to be discontinued, for lack of sufficient teaching force. This should be restored to the curriculum and the necessary assistance be provided to enable the course to be given.

The course in physical chemistry, essential to chemical engineering and required in our chemical engineering course, is absolutely without apparatus, and the chemistry department, as a whole, has no provision instruments. In other words, our chemical laboratory is more like that of a high school than of a college or technical school—a condition which should be remedied without delay.

NEED FOR ADEQUATE SALARIES.

I hesitate to even mention the subject of salaries, knowing that it will be misinterpreted as a matter of self-seeking on the part of the teaching force. As a matter of fact, however, the teachers are not the ones who suffer when the institution fails to provide adequate compensation, as they can usually obtain better pay from other institutions, or, in the case of engineering teachers, by going into practice of their profession. That this is no idle statement must be apparent from the fact that in the twelve months preceding this writing nine persons were used to fill the six regular positions in the Engineering College. This does not include the two appointees to the extra positions paid out of the emergency fund, one of whom has definitely refused to return next year, and the other has not accepted the offer for his continuance, but asks extension of time to come to a decision.

It will, of course, always be possible to fill any sort of an underpaid position of any kind with an incompetent; and if this institution cannot place its scale of remuneration on a par with others, the certain result will be the filling of its faculty with incompetents. It will then be the student body who will suffer, and through them the state as a whole.

I have happened on some figures (Engineering News-Record, May 6, 1920, P. 907) for the payment of engineering teachers in the State of Iowa —a State by no means in the forefront in its support of higher education. They are as follows:

IN IOWA.

	Average Salary 1915	Average Salary 1919	Percentage of Increase
Deans and Directors ....$	4,900	$ 5,150	5.1
14 Professors	2,900	3,726	28.44
18 Associate Professors	1,955	2,546	30.23
14 Assistant Professors	1,585	2,025	27.76
23 Instructors	1,194	1,628	37.20

Compare these figures with corresponding figures in the Engineering College at the University of Florida, which are as follows:

IN FLORIDA.

	Average Salary 1915	Average Salary 1919	Percentage of Increase
Dean (Not a Separate Office from that of Profesor) ....$	200	$ 200 (Added to a professor's salary for giving extra services as dean)	%
Professor	2,000	2,300	15%
Assistant Professor	1,500	1,800	20%
Instructor	800	None of this rank.	

How can the State of Florida hope to attract or hold the sort of teachers its students have a right to expect when offering remuneration so far below that of other States? How can the university maintain the morale of its faculty—how can its faculty be expected to believe in its fairness as an employer when in the face of a 100 per cent. increase in cost of living, its raises tne already inadequate salaries by only half of the percentage of increase granted in other institutions?

NEED FOR JANITOR SERVICE.

My last biennial report and preceding ones as well, pointed out the need of providing proper janitor service of the engineering building. The need still exists.

NEED FOR EQUIPMENT.

The appropriation for building and equipping the shop wing to the engineering building was exhausted in putting up the wing and nothing has been available for equipping it. The last Legislature having failed to appropriate for equipping it, this large space remains vacant and unused, while the shop work is still carried on with the old equipment inherited from the former Florida A. & M. College at Lake City. This equipment is totally inadequate in quantity; some of it is obsolete; all is more or less worn out; and some is positively unsafe. Unless this can be replaced very promptly, it will become so nearly useless that the shop courses will have to be discontinued.

As mentioned in preceding reports the steam laboratory has never been equipped, the testing and hydraulics laboratories have only the beginnings of equipment. Provision should be made for putting them into order.

With the greatly increased number of students, the apparatus in the other laboratories is no longer sufficient to go around, and a great many pieces ought to be duplicated.

NEED FOR IMPROVED LIBRARY FACILITIES.

The general library of the University of Florida has comparatively few technical books available for use. It has about 5,000 volumes of government documents, a large part of which are technical books of the greatest value, but the librarian has never found time to put these books in order, and at present it is impossible to locate volumes which may be needed among them. Enough assistance should be provided in the library to enable it to get the use out of the technical books it has, as well as out of its general literature.

To meet the needs mentioned here, and which must be met if the College of Engineering is to meet the increased demand, for its services, and maintain the quality of instruction it has given in the past, the following increase in appropriation will be necessary:

(A) The allowance for current expenses must be increased by $35,840.00 for the biennium, in addition to continuance of the present salary list and current allowance for the departments; the increase to cover the following items:

1. Addition to the teaching force as follows: Two assistant professors at $2,500 annually each, and two instructors at $1,800 annually each, total for the biennium..............$17,200.00
2. Increases in the salaries for the present teaching positions. $6,200 per annum, or for the biennium.................. 12,.00.00
3. For an adequately paid, full-time janitor for the engineering building, shops and physics department, $1,200 for the biennium. The present allowance for half-time janitor being $320; the increase required for the biennium amounts to 880.00

4. Increase in office expenses (stenographic assistance, postage and stationery) for the biennium	500.00
5. Student assistants in the laboratories, five to give 6 hours a week each, for the biennium	*1,500.00
6. Increase of allowance for current expenses of the departments, to meet increased cost of laboratory supplies; for the biennium	1,200.00
7. Assistant to the librarian in order to make available the unarranged technical government documents (about 5,000 in number) and also assist in general library work, at $90 monthly; for the biennium	2,160.00
Total for the increase of current expenses for the biennium	$35,840.00

This represents, of course, a large percentage increase over past allowances for current expenses; but it should be remembered that past alloiwances have been decidedly inadequate. In the face of increasing enrollment, the College of Engineering has been starved back for years, and this year has practically broken down for lack of teaching force and facilities. The number of students in the College of Engineering is three times what it was when the present scale of current expenses was fixed, and the general level of prices has doubled in the same interval.

(B) Appropriation for about $50,000 must be made for new equipment, and its installation, as follows:

1. To replace the wornout 20-year-old equipment of the wood shop	$15,000.00
2. To equip forge shop (present equipment accommodates one-fourth of the class)	5,000.00
3. Foundry	5,000.00
4. Steam laboratory (present equipment consists of one wornout steam engine, acquired second-hand 15 years ago)	10,000.00
5. Hydraulic and testing laboratories	10,000.00
6 Duplication of apparatus, for increased number of students in other laboratories	5,000.00
Total for new equipment	$50,000.00

This is a larger appropriation than has been asked for equipment of the Engineering College before, but it should not be forgotten that this college received only $900 for new equipment from the appropriation made by the last Legislature. Our Engineering College never has been provided with the complete equipment that other technical schools have, and this must be provided if our engineering students are to receive as good training as they can obtain elsewhere.

WORK OF THE DEAN.

In conclusion, may I make a personal statement?

The year just completed is the tenth during which I have acted as Dean of the College of Engineering. Durin gthis decade the annual enrollment of engineering students has increased from 43 to 149, in spite of increased entrance requirements. The building and equipment used have been greatly increased. The college and its work have been made known to practicing engineers throughout Florida, and to employers of technical graduates throughout the country. Ten years ago we had difficulty in finding positions for our graduates; now employers ask us for more than we can supply.

During all this period of expansion I have served as dean in addition to carrying a full teaching schedule as professor of physics and electrical engineering, notwithstanding that my duties as dean consume a great deal of time, never less than an hour a day. I have given these extra services for part of the time without extra compensation, and for the rest at merely nominal compensation. I have been glad to give these services to an institution whose welfare I have very much at heart; but I feel that my fair share has now been done, and that I can without impropriety ask that the burden hereafter be transferred to some other member of our engineering faculty. I would accordingly be glad if you would release me now from the deanship of engineering, and let me hereafter devote my full time to the congenial work of my department of physics and electrical engineering, to which it is difficult to do justice while acting as dean.

Respectfully submitted,

J. R. BENTON.

SUMMARY BUDGET FOR COLLEGE OF ENGINEERING.

	Salary	Current Expenses	Permt. Improv.	Total
General	$ 1,250	$ 70	$ 2,500	$ 3,820
Civil Engineering	6,250	225	5,000	11,475
Electrical Engineering	6,250	225	.....	6,475
Mechanical Engineering	12,850	650	17,500	31,000
Chemical Engineering	3,000	.....	.....	3,000
Total	$ 29,600	$ 1,170	$ 25,000	$ 55,770

DETAIL BUDGET FOR COLLEGE OF ENGINEERING.

I. General.			
Salary—			
(1) Dean	$ 500		
(2) Stenographer	750	$1,250	
Current Expense—			
Office supplies		$ 70	
Permanent Improvement—			
Apparatus (to be distributed to depts.)*		$2,500	$3,820
II. Civil Engineering.			
Salary—			
(1) Profesor of Civil Engineering	$3,500		
(2) Assistant Prof. of Civil Engineering	2,500		
(3) Student Assistant	250	$6,250	
Current Expense—			
Maintenance of Laboratory and Instruments.		$ 225	
Permanent Improvement—			
Equipment of Hydraulic Laboratory*		$5,000	$11,475
III. Electrical Engineering.			
Salary—			
(1) Professor of Physics and Electrical Eng.	$3,500		
(2) Assistant Professor of Electrical Eng.	2,500		
(3) Student Assistant	$ 250	$6,250	
Current Expense—			
Maintenance of Laboratory		$ 225	$6,475
IV. Mechanical Engineering.			
Salary—			
(1) Professor of Mechanical Engineering	$3,500		
(2) Associate Professor of Mechanic Arts	3,000		
(3) Assistant Professor of Mechanical Eng.	2,500		
(4) Instructor in Mechanic Arts	1,800		
(5) Instructor in Drawing	1,800		
(6) Student Assistant	$ 250	$12,850	

---

*To replace worn out apparatus; for additional machinery and equipment for new shops erected three years ago, but not used for lack of funds for apparatus and supplies.

Current Expense—			
Maintenance of Shops		$ 650	
Permanent Improvement—			
(1) Equipment of Wood-Shop*	$7,500		
(2) Equipment of Forge*	2,500		
(3) Equipment of Foundry*	2,500		
(4) Equipment of steam laboratory*	$5,000	$17,500	$31,000
V. Chemical Engineering.			
Salary—			
Associate Professor of Chemical Engineering	$3,000		$3,000
For Current Expenses and Permanent Improvement See Budget for Chemistry Under College of Arts and Sciences.			
Total			$55,770
Deduct			10,500
Total Annual Appropriation			$45,270

DEAN'S BIENNIAL REPORT, COLLEGE OF LAW.

UNIVERSITY OF FLORIDA.

June 16th, 1920.

To the President:

I respectfully submit herewith the following report upon the condition, progress and needs of the College of Law.

General Statement.—Beginning with the session of 1917-18 the College of Law has offered a three-year course. It consists of fifteen recitation hours per week each semester. The work is heavier than a number of schools require and standard in every way. The course is approved for three years by the Board of Regents of the State of New York, which enables a candidate for admission to the New York bar to do his prerequisite law school work entirely in Florida. Recognition of the high standing of the college is evidenced also by the installation of a chapter of the Phi Delta Phi—the oldest and largest organization of its kind in the United States.

It would assist the college to maintain a leading position among American law schools should the Legislature require, as many Legislatures have done, some academic and law school preparation of applicants for the bar examination.

Students who entered the college before the course was extended to three years, and whose course was interrupted by the war, have been allowed to return and graduate on the two-year basis. Twelve graduates of 1920 finished on this preparation.

Student Body.—During the last biennium the college, as heretofore, has continued as aggressive campaign for students. Its enrollment for 1919 was sixty-four; for 1920, it was ninety-eight. Nothing could much better show the vitality of the college than its enrollment during the war period, when at least fourteen reputable law schools closed their doors.

It may be valuable to note the preliminary training of the students enrolled during the session of 1919-20. The analysis follows:

Class.	Education Minimum	College 1 Year	College 2 Years	College 3 Years	College Degree	Total Enrollm't
Senior	10	3	3	3	4	23
Junior	8	4	1	2	0	15
First Year	36	8	5	2	2	53
Specials (Lee than 16 units)						7
Total enrollment						98

In 1919 the college graduated three men; in 1920 it graduated eighteen. The small number of graduates in 1919 is explained by the war and the fact that, due to the extension of the course to three years, there was no regular senior class. Three of the graduates of 1920 received the degree of Juris Doctor. This is the first time that this degree has been conferred by the university.

Under the Buckman Act no woman can become a student in the College of Law. The State at present offers to women no opportunity for legal training. In view of the cultural and practical value of such training and the demonstrated capacity of women to profit by it, the failure of the State to offer women an opportunity to study law appears to be a regrettable discrimination. At the State convention of the Business and Professional Clubs of Florida, held in June, 1920, a resolution in favor of admitting women to the university was adopted. The college, therefore, recommends that the admission of women to the State Law School be brought to the attention of the Legislature, believing that there is no just reason for refusing equal opportunities to women for a legal education. Were admission limited to women who had received a diploma or degree, it could not even be argued that any other State school would be deprived of a single student.

Faculty.—At the close of the session of 1919 Professor Earl C. Arnold, A. B., LL. B. (Northwestern), resigned to accept a professorship in the law school of Cincinnati University, a school having a smaller law enrollment than our own. Professor Arnold teaches seven hours per week at Cincinnati and next year is to receive $4,000.00 per year.

The college, however, was very fortunate to secure the services of Robert S. Cockrell, A. M., B. L. (Virginia), and John H. Moore, A. B., J. D. (Chicago). For fourteen years Judge Cockrell has been a member of the Supreme Court of Florida. He has had charge of our practice Court and has taught practical subjects, where his extensive knowledge of Florida law has been of the most service. Doctor Moore has had valuable experience in legal editorial work. He came to us from the employ of Callaghan & Co., of Chicago, one of the leading law book publishers of the United States. Both men devote their entire time to instruction and have met with gratifying success.

We now have four law professors giving their entire time to teaching. To offer the full three-year course it is necessary to have five full-time men. We have gotten along so far by the makeshift of alternating ten or eleven hours of work. This is unsatisfactory, and students have been deprived of class instruction in subjects required for graduation. Consequently; the addition of another full-time law professor is earnestly recommended.

Law Library.—The library is in the law building and is in charge of a librarian. It consists at present of 5,414 separately bound volumes. It is an excellent working library, although in comparison with the libraries of the large law schools it is small. The New International Encyclopaedia shows the leading law school libraries to be:

School.	Volumes.
Harvard	150,000
Columbia	55,000
Pennsylvania	50,125
Cornell	44,000
Northwestern	40,000
Chicago	36,000
Yale	35,000
Michigan	32,000

Some of the State reports not in the reporters are yet to be acquired. Our library is especially weak in text books, works like "Words and Phrases," and legal periodicals. Our current subscriptions run about $350.00 per year. A request for $7,000 for the biennium for the law library is included in the recommendations. Considerable sums must be spent for bookstacks, but they will be bought so far as possible from the balance of the sum given for permanent improvements.

Function and Prospects.—Law is a liberal education. It cultivates and disciplines the mind; develops personal capacity and leadership, and imparts the essentials of business and of government. Were there no such thing as the legal profession, the College of Law, in training for active life, would hold its own as a practical College of Arts and Sciences; for the history of man—the story of his struggles and achievements—is written just as fully and significantly in his laws as it is in his language, art, literature, philosophy, or science.

To regard lawyers as parasitic is as untenable as to regard doctors or railroads as parasitic. Doctors do not create life or health. Railroads do not produce livestock or citrus fruit. But doctors conserve life and health. Railroads, as a mean of marketing, enhance the value of crops and livestock. Lawyers, likewise, do not create life, raise cattle, or grow vegetables. But lawyers add to the value of life, liberty, and property, protecting them by advice and defending them in the courts. To be swindled out of a crop for the want of a lawyer is as great a loss to the individual as to have the crop rot in the field for the want of a railroad. Life, liberty and property are worth more in the United States than in Mexico, because lawyers are able better to do their work here.

A poor lawyer is as damaging to society as a poor doctor—he leaves a trail of loss and blasted hopes behind him. Generally a shyster lawyer is one who has left the field of useful endeavor in the profession, because his scanty knowledge does not enable him to make a living there. Therefore, the college believes that it can be of the greatest benefit to the State only by the avoidance of "short cuts" to a legal education and the maintenance of the highest standards. Its rapid growth is due to the unquestioned worth and achievement of its graduates. Its prospects for greater service and distinction are very bright.

The material development of Florida will suffer if the college suffers. It is by far the cheapest college on the campus to maintain. It is the only college enriching the university by tuition fees. Hence it should be supported with liberality sufficient to continue its development without check or hindrance.

The Imperative Need.—The imperative need of the College of Law, as of every other college, is a "living wage"—a salary that will enable professors to live in simple respectability. This need overshadows that of buildings, equipment, expansion, or any other claim whatsoever. Words cannot express the humiliation and discouragement of professors of every department of the university during the last two years. After the severest economy some professors suffered a substantial deficit at the end of each year. It has been difficult for a professor to respect himself or his work when negro plasterers at the university have been paid a higher rate of compensation per hour for time employed than he has received. Leaving out of account social justice, ignoring the desirability of retaining men experienced in the conditions and needs of Florida, the fact remains that no professor can do his work harassed by financial cares, the fear of the poorhouse and the debasing consciousness that he is a member of a "submerged class."

Recommendations.—The financial needs of the college for the next biennium are summarized by the following recommendations. They are conservative and cannot be "scaled down" without serious injury:

1. Salaries of five professors, secretary and librarian	$38,600
2. Permanent improvements—current subscriptions, books, book stacks, office fixtures, desks, electric fixtures, etc.	7,600
3. Current expenses—printing, stationery, stamps, office supplies, mimeographing examinations and outlines, repairs, etc.	800
Total of recommendations for the biennium	$47,000

Respectfully submitted,

HARRY R. TRUSLER, Dean.

DEAN'S BIENNIAL REPORT, TEACHERS' COLLEGE AND NORMAL SCHOOL, UNIVERSITY OF FLORIDA.

To the President:

During the past biennium Teachers' College has not had the opportunity to render the service to the educational interests of the State that we desired; because of the fact that so many of our young men from the educational field entered the army, and, upon being mustered out, took up other lines of work which offered them far greater remuneration than teaching. During the past year, however, conditions were better, and the enrollment much larger than before. Present tendencies seem to indicate that a still greater number of men are planning to enter the teaching profession; but, however, great this increase, the number will still be woefully inadequate to meet the demands of the State. In spite of the fact that the enrollment was not large during the biennium, we feel proud of the men the university has prepared for the public schools of Florida during this period; many of the best positions in the State are filled by graduates from Teachers' College, and the best schools are coming to depend more and more upon the university to fill these places.

There have been but few changes in the faculty during the past two years. Professor L. W. Buchholz has given part of his time to vocational rehabilitation work, and will continue this work during the next year at least. Professor W. S. Cawthon, who has been professor of secondary education and State high school inspector, working under the State Superintendent of Public Instruction and the university, will give his time entirely to the State Superintendent's office, and Dr. Joseph Roemer will take his place as professor of secondary education at the university. Teachers' College is to be congratulated upon the fact that it has kept its corps of teachers with so few changes, and it is to be hoped that a salary adequate to hold them will be paid in the future.

Looking to the future, there are several facts that should be presented:

SALARIES.

The salaries of our men are far below a living wage, and if we expect to hold them, there should be an increase of at least 50 per cent. over the present salaries.

EQUIPMENT FOR CLASSROOMS AND OFFICES.

The permanent equipment for clasrooms and offices is entirely inadequate for efficient work; several of the teachers are without classroom and office desks, and a number of the rooms do not have enough seats for the regular year, not to mention the crowded condition of the summer session. It will take at least fifteen hundred dollars ($1,500) to properly equip the offices and classrooms for efficient work.

In addition to the permanent equipment, there should be five hundred dollars ($500) provided for repair work on Teachers' College building; the platform at the north entrance has settled nearly two inches; this should be looked after, as well as other needed repairs about the building.

PRACTICE HIGH SCHOOL LABORATORIES.

The laboratories for the Practice High School are practically without equipment. In order to train our men to fill the scientific positions in the State, they should have model laboratories for general science, chemistry, physics, botany and zoology. These laboratories should be as well equipped as the laboratories of the average high schools in the State. During the past four years we have had but seventy-five dollars to spend on the five laboratories, and, as a result, the supplies and equipment were so completely exhausted that only one laboratory course could be given during the past year. There should be at least one thousand dollars ($1,000) appropriated for permanent equipment for these five laboratories, and five hundred dollars ($500) for supplies.

PSYCHOLOGICAL LABORATORY.

There is a growing demand for men trained to understand and help correct the many mental and physical defects found among the children of our public schools. In order to meet this demand, the laboratory for general psychology should be better equipped, and there should be added enough equipment to provide for a laboratory course in educational psychology. At least seven hundred and fifty dollars ($750) should be provided for this purpose.

EDUCATIONAL EXHIBIT ROOM.

The Educational Exhibit Room, which was instituted two years ago, has proven to be of great value to the students of Teachers' College and the teachers attending the summer sessions. All the educational bulletins of the State departments of education of the various states, as well as those of the Bureau of Education of the Federal Government, are catalogued in this room. In addition to these bulletins, there are many public school and educational exhibits from different sections of the State and country. These exhibits should be added to as new material comes out. At least two hundred and fifty dollars ($250) should be provided for this purpose.

TRAVELING EXPENSES.

There should be a fund of at least twelve hundred dollars ($1,200) set aside for traveling expenses, to make it possible for the professor of secondary education to visit the high schools of the State and render assistance wherever possible. The General Education Board is kind enough to pay his salary with the understanding that his traveling expenses should be taken care of by the university. If the above amount is allowed, it would make it possible for other professors in Teachers' College to reach strategic points in the State where much good might be done. Frequently a teacher can do more good by giving a few hours of his service to some of the more needy schools than in most any other way, and, as a rule, the more needy the school, the less they are inclined to pay traveling expenses.

FELLOWSHIPS.

During the past biennium we have had several strong men taking advanced work in Teachers' College, and teaching one or more classes in the Practice High School under the supervision of the professors in the college. In this way the men not only take charge of the classes in the Practice High School, but also get valuable experience as teachers, so that when they go out to take positions they are better prepared to do the work than they would be otherwise. We should have at least one thousand dollars ($1,000) annually to provide for five fellowships.

LABORATORY ASSISTANTS.

There should be two student assistants in psychology to carry on the work for the next biennium; one assistant for general psychology, to help with the papers and in the laboratory, and one student assistant in educational psychology to assist in the laboratory for educational psychology. The sum of five hundred dollars ($500) should be set aside for this purpose.

OFFICE WORK AND SUPPLIES.

The office work in Teachers' College has reached the place where it is all but impossible for one person to handle the work, since the secretary has, besides the general correspondence, the correspondence of the professor of secondary education and the correspondence connected with the Teachers' Employment Bureau. In addition to this, she is registrar for the Summer School, which makes the burden extremely heavy. The salary for this position should be at least eighteen hundred dollars ($1,800).

In order to carry on the work in the dean's office in its various fields, there should be at least nine hundred dollars ($900) appropriated for office supplies.

VOCATIONAL EDUCATION.

Under the bill provided for the acceptance of federal aid for the training of teachers in vocational education, the university was designated as the institution at which teachers in agriculture and trades and industries should be trained. This work has been carried on during the past biennium with marked success, and a number of men are now being prepared for teaching in the field. Two instructors have been employed during the past biennium, but it is found necessary to provide for a third man to take charge of work that is not offered in any of the departments of the university. The salary should be that of a full professor—thirty-five hundred dollars ($3,500).

EMPLOYMENT BUREAU.

During the past two years more than five hundred teachers have secured positions in the schools of our State through the help of the Teachers' College Employment Bureau. In addition to this, many requests for information concerning teachers registered with the bureau have given opportunities to assist other communities in securing good teachers. The bureau has already assisted in locating about two hundred and fifty teachers for the coming year, and many more than that number of calls have come from school officials each year which we have been unable to answer. The school officials of the State are depending upon us more and more to help in securing principals and teachers for their schools, and it is the purpose of the bureau to do all it can to give first-class service in this work.

SUMMER SCHOOL.

During the past biennium the Summer School has grown by leaps and bounds; there were six hundred and twelve (612) in attendance during the summer session of 1919, and seven hundred and forty-four (744) during the summer of 1920. Not only has the number of students increased, but each year they are showing a more earnest desire to get a better education; a large number of students during the past summer took college and graduate work, while many more were working for a normal diploma. During the past summer the classes were greatly overcrowded, making it very difficult to do efficient work; this was especially true in several subjects where the best work should have been done. To meet this overcrowded condition and properly supply the needs of the Summer School, we recommend an annual budget of ten thousand dollars ($10,000). While the summer session is never as satisfactory as the regular year's work, yet we believe the work is so valuable to the teaching profession of the State that the best possible provision should be made for the teachers attending the summer sessions.

CO-EDUCATION.

Throughout the State there is a great scarcity of trained teachers; last year our office correspondence showed an absolute shortage of about seven hundred and fifty teachers. If we add to this the greater number of untrained teachers who were employed to "keep" school, it is not difficult to see how serious the educational situation is becoming in the State. This situation is all the more appalling when we realize that the rural schools are suffering the greatest dearth of teachers, and as a result there is a tendency for the most progressive farmers to move to the cities where their children may have better educational opportunities. To help meet this condition, we recommend that Teachers' College be made co-educational, in order that we may train as many teachers as possible. For the present, this would involve very little added expense, as the present faculty could handle two hundred more pupils almost as easily as they do the present number. Of course, in time there would be a demand for a complete model training school with supervisors and critics, but however great the cost, it seems to us that the present lack of trained teachers is such a menace to the future life of the State, that every effort should be made to secure more trained teachers, however great the expense. Should co-education be adopted, a woman's dormitory would have to be erected in the near future.

Respectfully submitted,

H. W. COX, Dean.

SUMMARY BUDGET OF TEACHERS COLLEGE.

	Salary	Current Expens's	Permt. Improv.	Total
General	$ 2,300	$2,100	$1,500	$ 5,900
Psychology	4,000	....	400	4,400
College Education	7,000	....	....	7,000
Elementary Education	3,500	....	....	3,500
Secondary Education	3,000	....	....	3,000
Agricultural Education	10,000	....	....	10,000
Normal School and Practice High School	3,500	500	1,500	5,500
Summer School	10,000	....	....	10,000
Total	$43,300	$2,600	$3,400	$49,300

DETAIL BUDGET FOR TEACHERS COLLEGE.

I. General.

Salary—			
(1) Dean	$ 500		
(2) Secretary to Dean	1,800	$2,300	
Current Expenses—			
(1) Office Supplies	$ 900		
(2) Traveling Expenses	1,200	$2,100	
Permanent Improvement—			
Desks and Completion of Peabody Hall		$1,500	$5,900

II. Psychology.			
Salary—			
(1) Professor of Psychology	$3,500		
(2) Student Assistant in Psychology	250		
(3) Student Assistant in Educational Psychology	250	$4,000	
Permanent Improvement—			
Apparatus in Psycnology Laboratory		400	$4,400
III. History, Theory and Arts of Education.			
Salary—			
(1) Professor of Eduation	$3,500		
(2) Professor of Education	3,500		$7,000
IV. Elementary Education.			
Salary—			
Professor of Elementary Education			$3,500
V. Secondary Education.			
Salary—			
Professor of Secondary Education			$3,000
VI. Agricultural Education.			
Salary—			
(1) Professor of Agricultural Education	$3,500		
(2) Professor of Industrial Education	3,500		
(3) Professor of Agricultural Education in Industrial Arts	3,000		$10,000
VII. Normal School.			
Salary—			
(1) Instructor in Languages	$2,500		
(2) Four Teaching Fellows	1,000	$3,500	
Current Expenses—			
Maintenance of Practice High School Laboratory		$ 500	
Permanent Equipment—			
Apparatus for Practice H. S. Laboratory		1,500	$5,500
VIII. Teachers Summer School.			
Salary (See Summer School Bulletin)			$10,000
Total			$49,300
Deduct			8,000
Total annual appropriation			$41,300

FIRST ANNUAL REPORT
GENERAL EXTENSION DIVISION
UNIVERSITY OF FLORIDA
OCTOBER 1, 1920

Gainesville, Fla., October 1, 1920.

President A. A. Murphree,
University of Florida.

Dear Sir:

I beg to submit herewith the first report concerning the activities of the General Extension Division of Florida for the period ending October 1, 1920.

WORK NOT AN EXPERIMENT.

General Extension work in America is not an experiment. Florida was the thirty-second (32d) State to establish a division, with headquarters at its State University. Thirty-eight (38) states now have divisions, and West Virginia, Alabama and Georgia have recently taken up the work in the South.

The Florida director began work October 1, 1919. October and November were devoted to securing equipment and the personnel of the division. The Extension Teaching Department, including the Extension Class Bureau and the Correspondence-Study Bureau, began work December 1, 1919, and two thousand one hundred and forty-nine (2,149) have already been registered in this department during the first ten months only, which are covered by this report.

FLORIDA SETS NEW RECORD.

A new record has been set by Florida through its correspondence-Study Bureau. With a small white population scattered over fifty-eight thousand six hundred and sixty-six (58,666) square miles and without the aid of a field organizer, thirteen hundred and five (1,305) registrations have been recorded during the first ten months. These registrations have come from each of the fifty-four (54) counties in the State and from persons interested in Florida living in thirteen (13) other states and two (2) foreign countries. The famous Wisconsin Division enrolled two hundred and fifteen (215) the first year and the Kansas Division fifty-seven (57), and these states have two and one-half (2 1-2) to four (4) times the white population of Florida.

This fact shows the need, demand and tremendous possibilities of education by General Extension methods in our State. To develop a department registering two thousand one hundred and forty-nine (2,149) people in so short a time has been an undertaking which has taxed the resources of the division to the utmost and retarded the development of the other departments with functions of equal value to Florida.

GENERAL EXTENSION ACTIVITIES INCLUDE ALL EXCEPT AGRICULTURE.

In detail, let it be said that in keeping with the provisions of the Act of 1918 Florida Legislature creating the General Extension Division "to gather information on all subjects useful to the people of Florida, and to carry it to them * * *; to spread knowledge among them * * *; to stimulate thought and encourage every movement among the people for their mutual improvement," the Division is endeavoring to make the university and State College for Women greater public service institutions, and represents every department of these institutions except Agriculture and home economics in the field. Through the General Extension Division the Colleges of Arts and Science, Education, Engineering and Law are given an opportunity and can serve all the people of the State in countless ways. The Division makes available their accumulated stores of valuable information, and is endeavoring to carry to all the people the educational and other advantages to be had through the State institutions and the various government boards and bureaus, much as the Agricultural and Home Economics Extension Service disseminates the valuable information to be had through the Agricultural College and Experiment Station and the United States Department of Agriculture.

ORGANIZATION.

In order to render the greatest public service in a growing State, the development of several departments with sub-divisions called bureaus has been necessary. Expansion within these departments will depend upon the demand and support from the people of the commonwealth.

The work of the General Extension Division has been divided into four departments:

1. Extension Teaching.
2. Public Welfare.
3. Instruction by Lectures and Public Discussion.
4. General Information and Service.

DEPARTMENT OF EXTENSION TEACHING.

The Department of Extension Teaching offers every Floridian an excellent opportunity to take practical courses that will help him advance in his vocation, finish his education, or take courses for culture. The work is carried on through

1. Correspondence Study Bureau.
2. Class Study Bureau.
3. Group Study Bureau.

CORRESPONDENCE STUDY BUREAU.

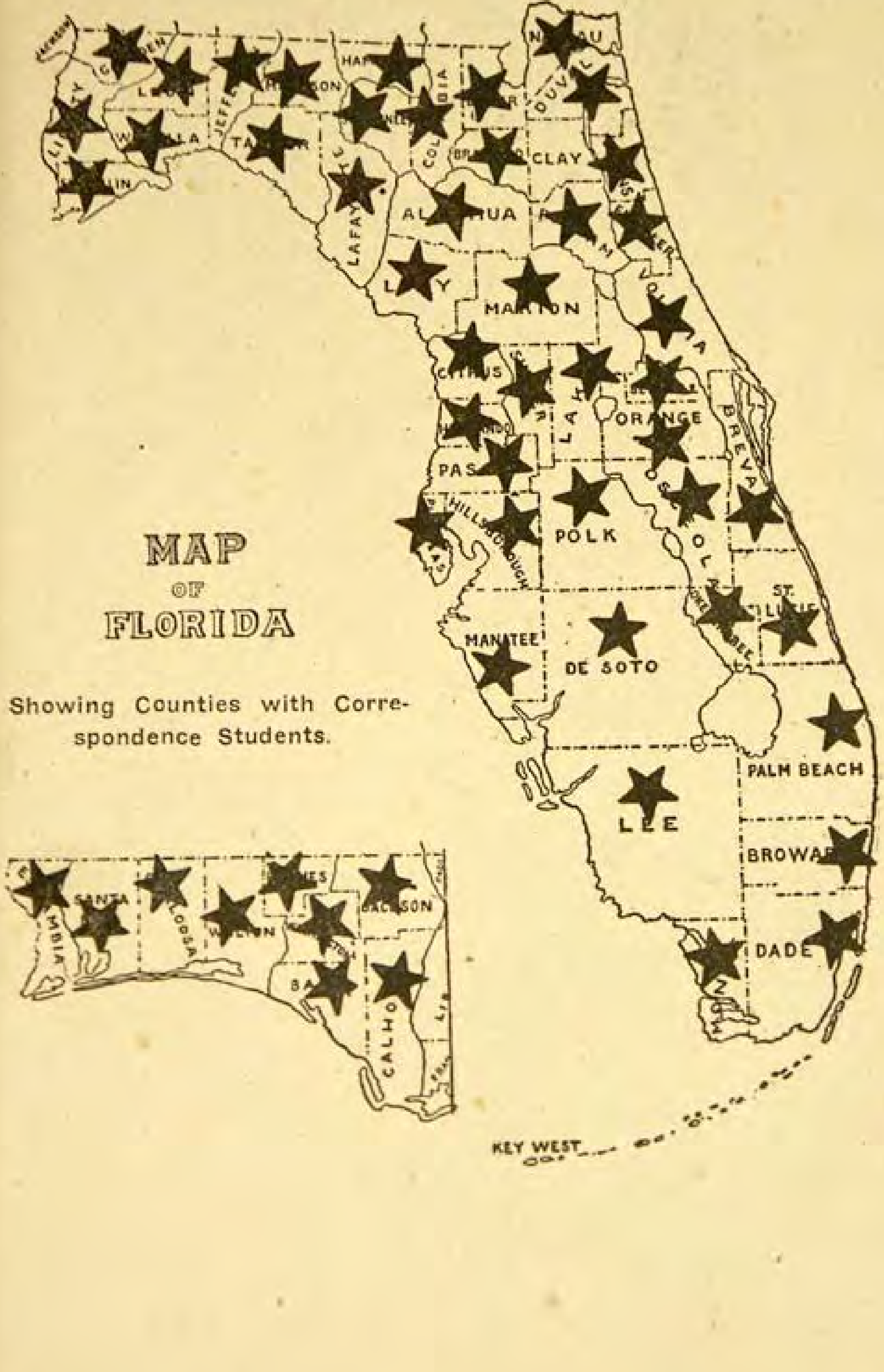
A system of correspondence study offering men and women everywhere an opportunity for educational advancement is the plan of the General Extension Director. As soon as possible, and as the funds will permit, the widest range of grades of study and supervised reading, covering the demands of our people, will be supplied.

The following general classification covers the work as it is now conducted:

Review Courses—For State and special teachers' certificates.
Civil Service Courses—To prepare for Government positions.
Commercial Courses—In preparation for business.
Agricultural and Other Reading Courses—For busy men and women.
Special Courses—Shop mathematics, manual training, estimating, etc.
High School Courses—For eighth grade and two and three-year high school graduates.

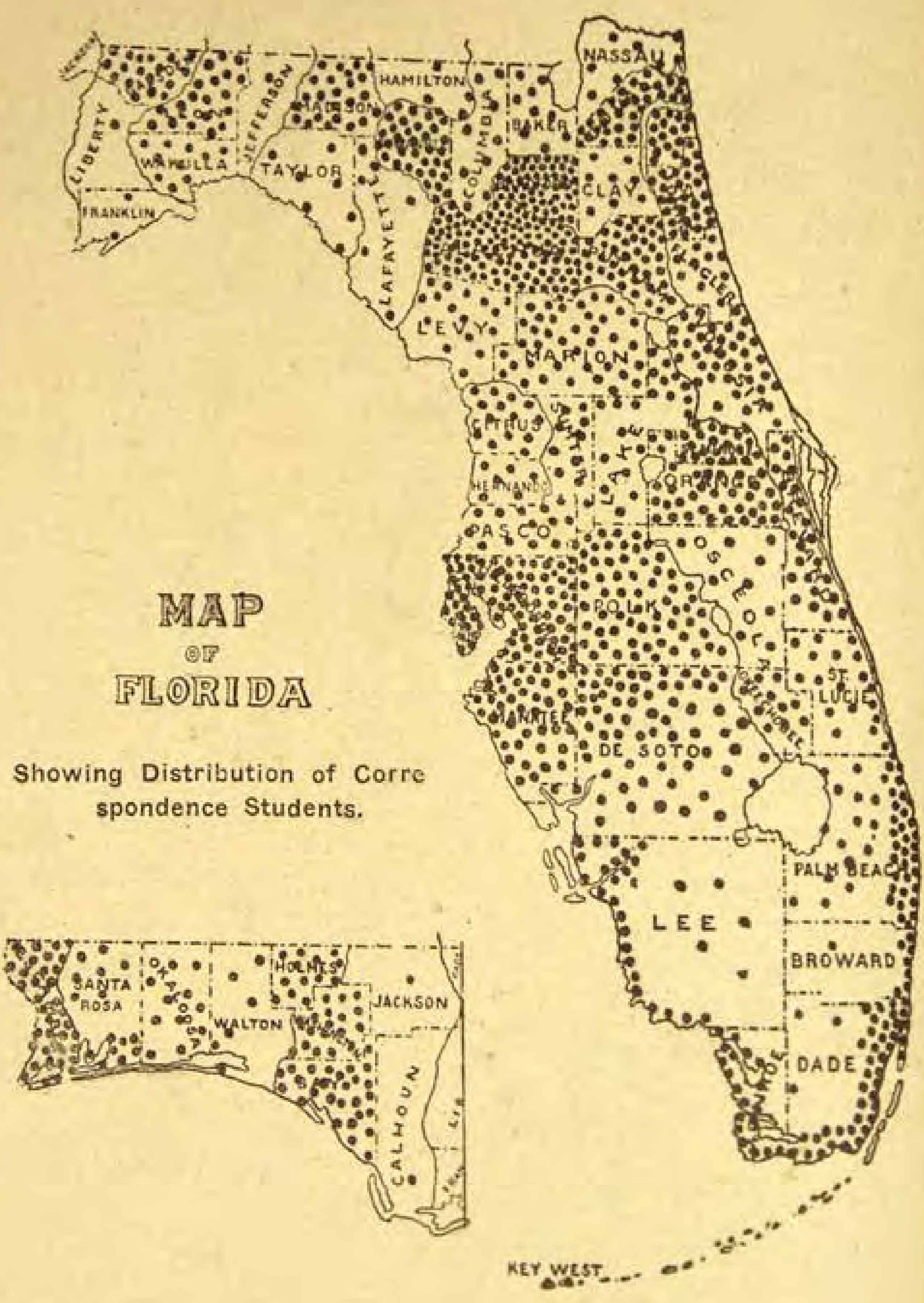
College Courses—Also preparation for professional schools.

All work is given to men and women and the high school and college credit earned by correspondence study is recognized by the University of Florida and the State College for Women. Students may enroll at any time, and proceed as rapidly as their time and ability will permit.



MAP
OF
FLORIDA

Showing Counties with Correspondence Students.



MAP OF FLORIDA

Showing Distribution of Correspondence Students.

PEOPLE WANT THE WORK.

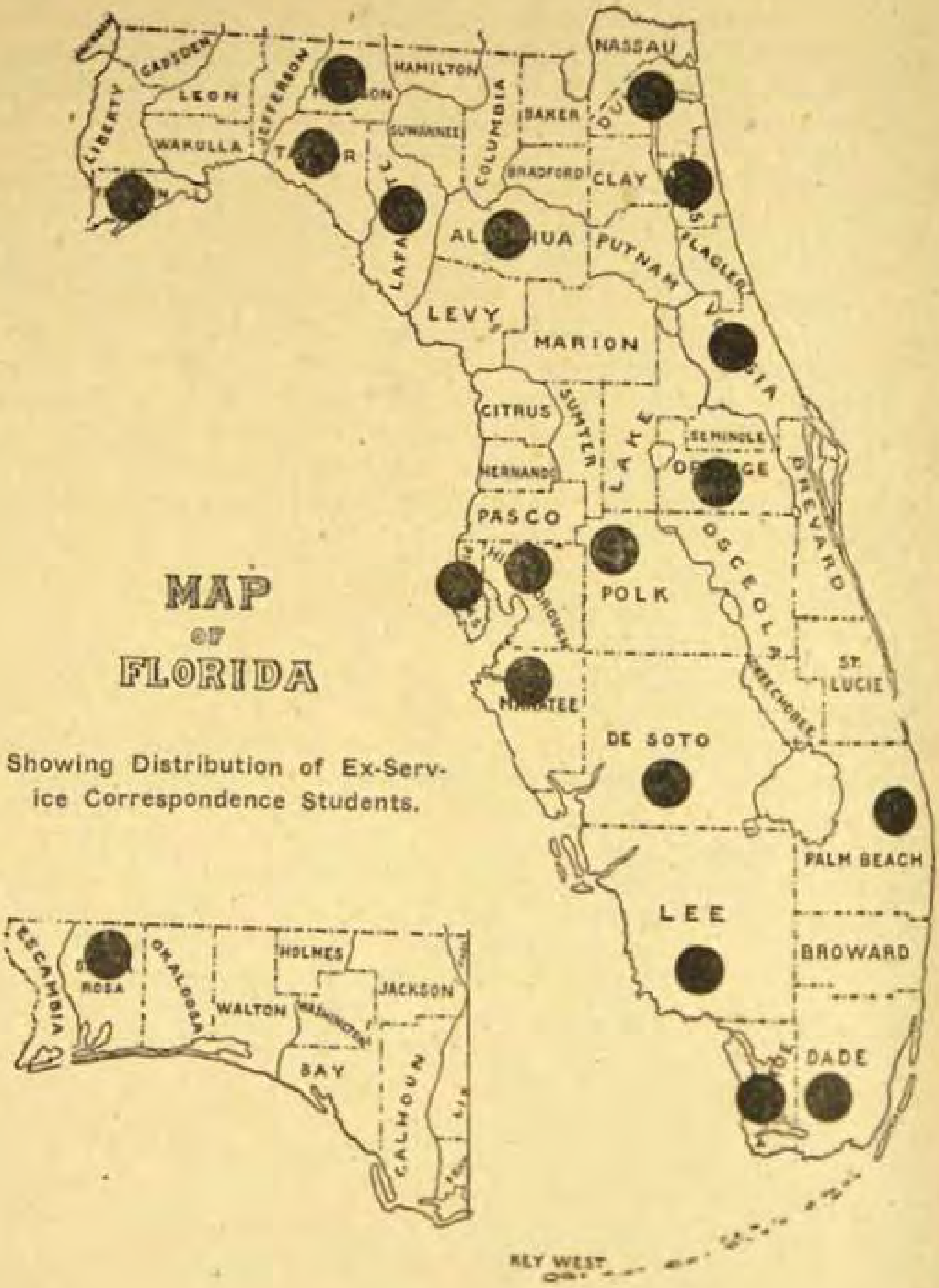
That the people of Florida appreciate the Correspondence Study Bureau is shown by the very large enrollment and the rate at which the work is growing. During the first month thirty-five (35) registrations were recorded—ten months later, during September, 1920, two hundred and thirty-five (235) registrations and applications were handled. Among those enrolled were clerks, farmers, teachers, ex-service men, business men, home makers, lawyers, civil officials and club women.

WORK REACHES THE PEOPLE.

Through correspondence study the division is reaching people who are beyond school age yet feel the need of more training and young people whose education has been interrupted. This is clearly shown by the fact that the age of students enrolled ranges from fifteen (15) to sixty-three (63) and the average age is twenty-eight (28). Students are found already in the rural sections of every one of the fifty-four (54) counties of the State and in two hundred and ninety-one (291) towns. Florida has only about five hundred and twenty-three (523) towns with a population of one hundred (100) or more.

MEETS SPECIAL NEEDS.

Every division must adapt itself to the various needs of the people; consequently an effort has been made to get the young people of the State to prepare to fill the teacher vacancies in our schools and to encourage teachers to better qualify themselves for their work. As a result, three hundred and sixty-two (362) registrations in teachers' courses have been received.



MAP
OF
FLORIDA

Showing Distribution of Ex-Service Correspondence Students.

BRIDGING GAP BETWEEN TWO-YEAR HIGH AND TECHNICAL SCHOOLS.

Special effort has also been made to encourage graduates of our two and three-year high schools to finish their work by correspondence study so that they can enter professional and technical schools and prepare for greater service to the State. That the division is bridging the gap which halts the education of so many of our young people is seen in the fact that three hundred and fourteen (314) students—sixty-six more than went to college from all the high schools in a single year, according to Professor W. N. Sheats' last report—are now finishing their high school work through correspondence-study.

HELPS EX-SERVICE MEN.

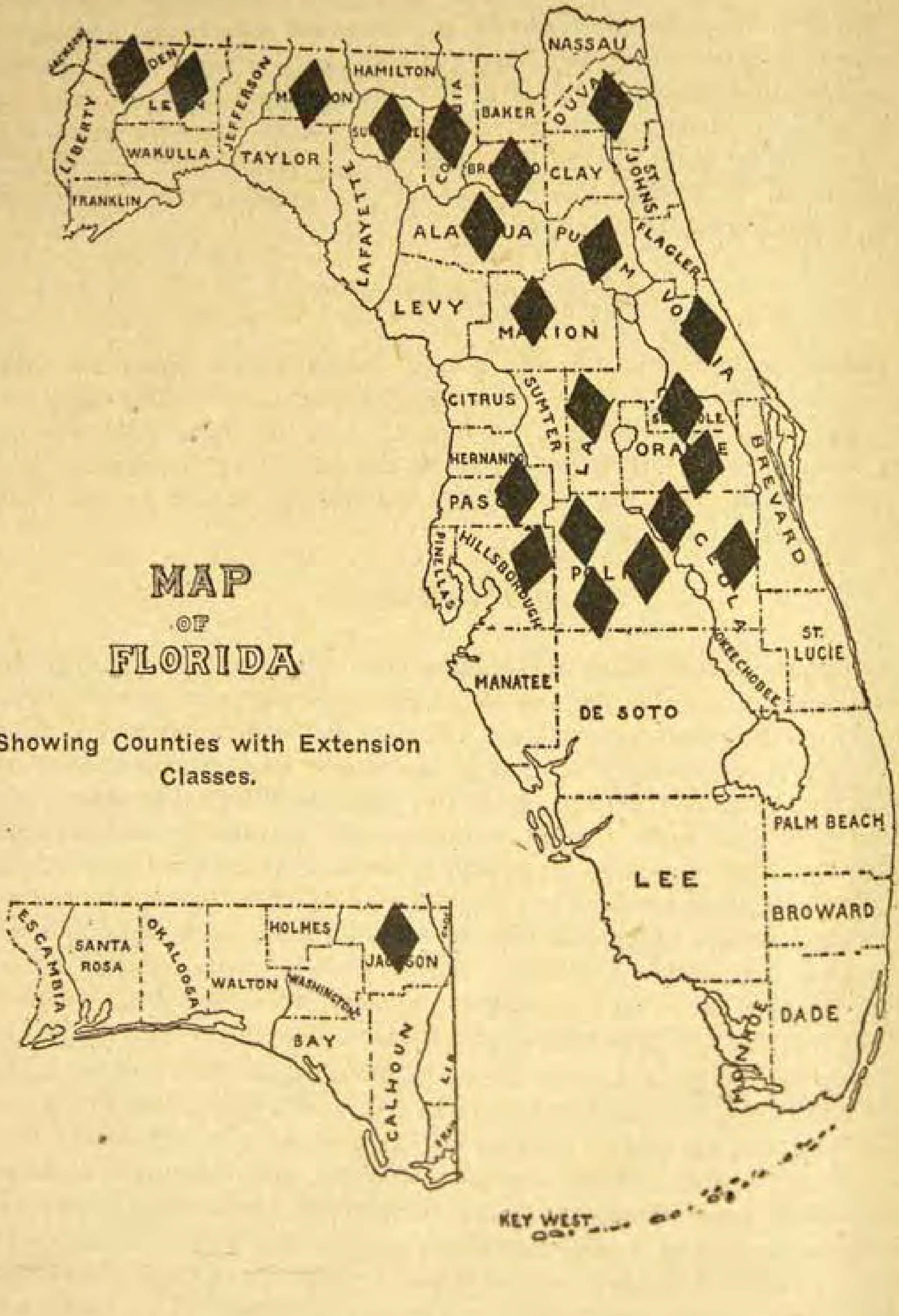
Ex-Service men who for any reason cannot go to school are given courses by mail. So far one (1) ex-service woman and thirty-eight (38) ex-service men from nineteen (19) counties of the State have accepted our offer. Citizens are urged to assist the bureau by acquainting more ex-service men with the educational advantages offered by the State through correspondence study.

CLASS STUDY BUREAU.

All of the leading State universities now offer instruction through extension classes and this method of "carrying the university to the people" has proven practical everywhere. Already the demand from groups of teachers and others for this kind of instruction has far overreached our ability to supply instructors. However, with one full-time instructor and the assistance of three regular faculty members available on week-ends, twenty-two (22) extension classes in nineteen (19) counties with a total enrollment of eight hundred and forty-four (844) have been conducted and the work finished. Requests for classes were granted in those subjects for which men were available. These include civic biology, nature study and English, and all lectures in class work were supplemented with regular written assignments for students desiring college credit.

The classes in civic biology were organized as the result of an agreement with the State Board of Health to give health instruction to the people. Work was carried on in twelve (12) counties and resulted in campaigns against the malaria mosquito, the fly, and infectious diseases. Communities were taught to guard themselves. Lake Butler won the distinction of having accomplished most under the extension instructor in charge, Dr. C. F. Hodge, a noted biologist, formerly of Clark University.

The classes in English were in charge of Professor E. C. Beck, who had the first extension class doing graduate work in the State at Sanford. Miss Julia Keeler sueprvised a course in industrial art at the State industrial School for Girls at Ocala.



MAP OF FLORIDA

Showing Counties with Extension Classes.

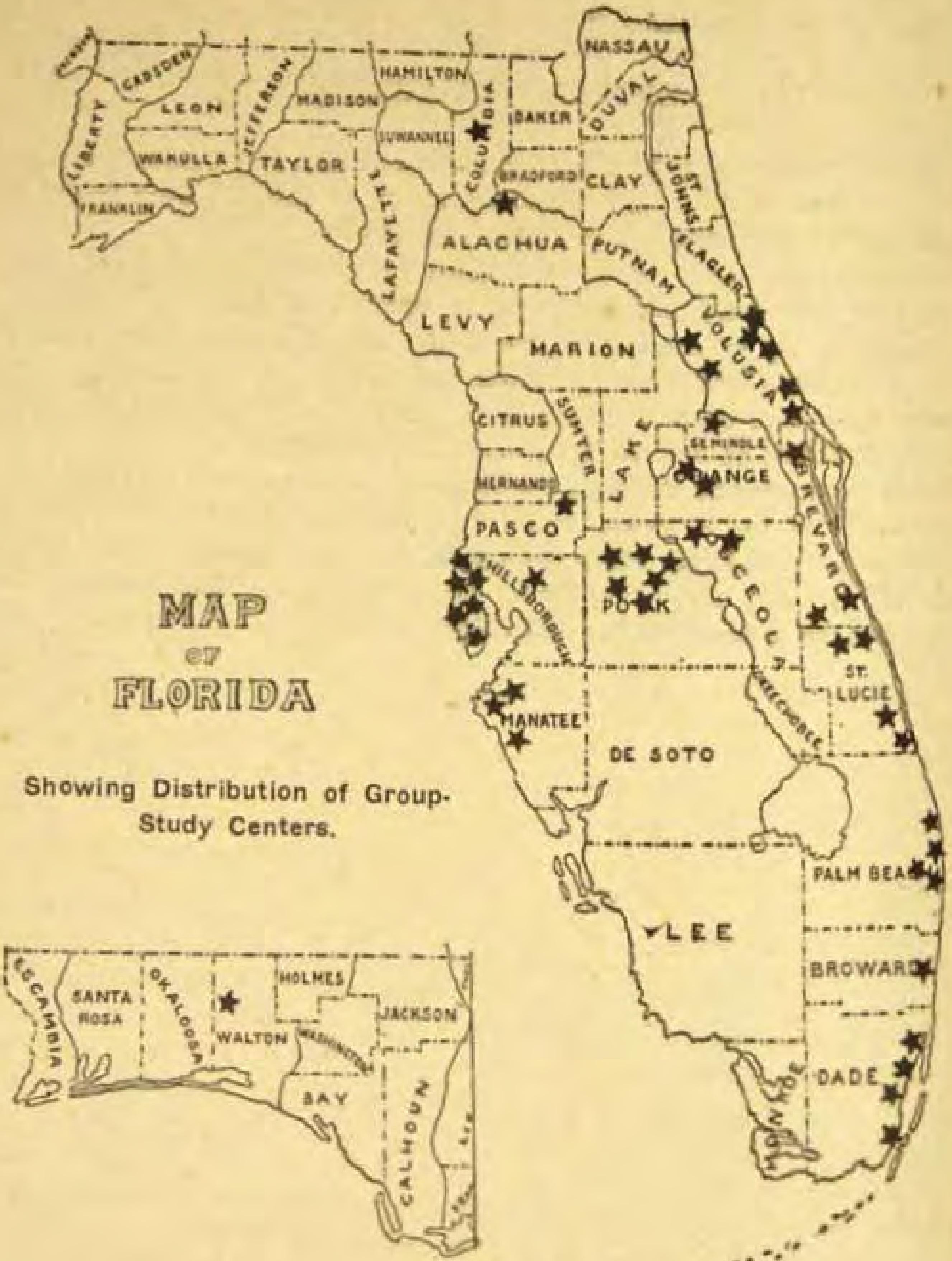
Professor J. W. Norman and Professor J. R. Fulk assisted groups of teashers at five different points in the State and aroused a great deal of interest in the technique of teaching and in review and special courses given by correspondence. Classes with unfinished work or recently organized are not reported here.

GROUP STUDY BUREAU.

Through the Group Study Bureau, groups of men and women interested in a given line of study are furnished an opportunity to work under the guidance of a specialist in the field of interest.

Approximately three thousand (3,000) in various groups have either started or will very soon take up a number of courses, including a systematic study of American government and civics, for which a thirty-two-page outline has been prepared and printed by the bureau. Mrs. Albert McMahon, of New York, is the instructor. The work is typical class instruction as defined by some other institutions.

Study Program and Outlines for Readers.—Four hundred and fifty-three (453) outlines on a great variety of subjects intended to serve as programs for clubs and study groups, have been prepared by the bureau and will be lent for examination upon request. These outlines will also serve as guides for the individual reader.



MAP
OF
FLORIDA

Showing Distribution of Group-Study Centers.

DEPARTMENT OF INSTRUCTION BY LECTURES AND PUBLIC DISCUSSION.

The Extension Lecture Bureau is maintained to serve the people by acting as a clearing house and arranging single lectures and lectures in series to be given by prominent professional men, ministers, State officials and university professors, on a wide range of subjects. These lectures are technical, informational, and inspirational, and suited for the programs of organizations, such as women's clubs, business men's leagues and other associations, as well as for institutes, conventions, commencement exercises and holiday programs. Through this bureau the extension workers, Dr. C. F. Hodge, Professor Charles F. Davis, and the Director of Extension, have spoken to special groups of citizens and school children in many sections of the State, reaching a total of thirty thousand (30,000) school children and adults.

Public discussion on questions of the day is encouraged, and suggestions for programs and debating material on a limited number of well-selected subjects are furnished.

Debating in the high schools of Florida will be promoted by this department during the winter.

DEPARTMENT OF PUBLIC WELFARE.

The Department of Public Welfare has carried on work in Americanization through District Americanization schools held at Orlando, West Palm Beach and Lake City. The Americanization School programs combined the best features of the short course institute and conference, and were put on with the idea that the citizens of Florida should take a greater interest in the operation of government and of State institutions as well as making good citizens of the foreign born.

The morning sessions were devoted to a study of American Government and Civics and the principles of citizenship, designed largely for representatives of women's clubs. Clubs from fourteen (14) different towns were represented at the Orlando meeting and representatives from a number on the East Coast attended the West Palm Beach School. This work was in charge of Professor Charles F. Davis, Americanization specialist with the General Extension Division.

The superintendents of the various State institutions and many prominent public officials appeared on the afternoon and evening programs and presented their post war problems. Specialists of national reputation also appeared on the program. Local questions on education, illiteracy, delinquency, health and recreation were taken up.

The open forum method was followed, and all were invited to take part in the discussion. Dr. Hasting H. Hart, of the Russell Sage Foundation, was engaged to appear on these programs; and the questions of interested citizens and the friendly criticisms and suggestions of Dr. Hart resulted in very valuable and helpful hints for the heads of our institutions, as well as focusing the people's attention, through the splendid co-operation of the State press, upon local problems as well as those concerning the State institutions. As a result of a lecture given by Mr. George White, Y. M. C. A. secretary at the university, the Lake City school board later secured a full-time recreation specialist for the community. Many other instances of resulting good could be cited.

Short courses for business people will be held.

During the coming year plans have been formulated to hold a number of community institutes in co-operation with the Red Cross, Anti-Tuberculosis Association, and other welfare agencies. Attached hereto find a copy of the Orlando Americanization School program.

DEPARTMENT OF GENERAL INFORMATION AND SERVICE.

1. Public Information Bureau.
2. Visual Instruction Bureau.
3. Public School and Community Center Bureau.

PUBLIC INFORMATION BUREAU.

Through this bureau the General Extension Division acts as a clearing house for all kinds of general information on questions outside of agriculture and home economics, which may be of value to individuals or groups. When information cannot be supplied directly, requests are referred to the proper authorities in the various State and government departments, boards and bureaus, colleges, universities and other public welfare agencies, many of which the average citizen knows nothing about or is unaware of his rights and privileges in asking for information and service.

This bureau has already sent out two hundred fifty six thousand three hundred (256,300) letters and valuable informational and educational bulletins and circulars. A bi-weekly clipping sheet of educational news for Florida newspapers will be published beginning October 30. This bureau promises to become one of our best public service agencies.

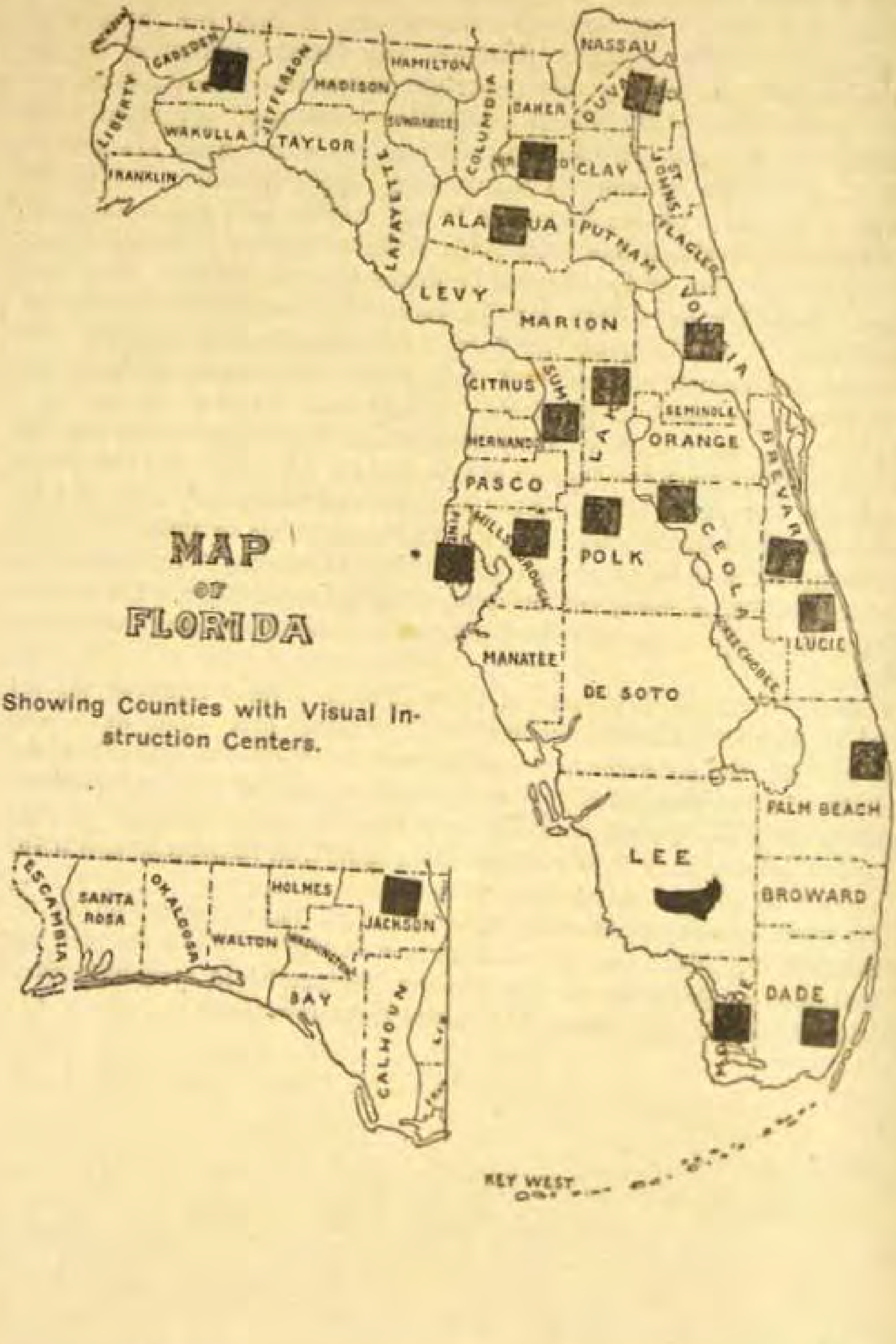
VISUAL INSTRUCTION BUREAU.

The educational value of slides and films for children and adults has been recognized for many years, and every State is sponsoring visual education in some form or other. Much educational material can be had through government bureaus and corporations, if they can have a responsible distributing agency; therefore, the Visual Instruction Bureau was established to develop this important factor in our educational system. Twenty-seven (27) visual instruction centers in seventeen (17) counties of the State are being served and slides and films are sent to Y. M. C. A.'s, State schools and institutions, county demonstration agents and all clubs and societies interested in educational work requesting help.

Films.—The Division has been made a State depository for the Visual Instruction Division of the Bureau of Education, Washington, D. C., and extreme Southern depository for the Bureau of Commercial Economics, Washington, D. C. Through the Bureau of Education and nineteen (19) industrial companies, one hundred forty (140) reels of one thousand feet (1,000) each, or one hundred forty thousand feet (140,000) of film have been secured, and are now being used in the visual instruction centers of the State. Through the Bureau of Commercial Economics and industrial companies, approximately an additional million (1,000,000) feet of film, with great educational value, are available from time to time. The subjects treated are Geography and Travel, Public Health, Americanization, Good Roads, Educational and Industrial Subjects. The Visual Instruction Bureau also owns a few educational films bearing on English, history and civics.

Slides.—Thirty-six (36) sets of approximately twelve hundred (1,200) slides in English, history, science and geography and travel have been purchased by the department to supplement the classroom work in these subjects or to be used as educational programs for the entire community. Lectures notes have been prepared to accompany all sets of slides. Seven (7) sets of slides have been received from industrial companies and many others can be secured as loans upon request.

The great educational worth of visual instruction is recognized by the teachers of the State, but the work is new and there is a great shortage of equipment; consequently, the division has purchased stereopticons to lend to all schools and others, who desire to borrow them.



MAP OF FLORIDA

Showing Counties with Visual Instruction Centers.

One day's shipment of slides and films from the General Extension Division to schools.

PUBLIC SCHOOL AND COMMUNITY CENTER BUREAU.

The Public School and Community Center Bureau is designed primarily to give assistance to teachers and to help develop the school house as a community center—a place where people will get together, where co-operation and good will will be born and much profit to the State result. Suggestions and material for school and community programs are furnished, educational information given and books lent.

Plays and Recitations.—All educators know the value of the dramatic in training the emotions and imagination of the child, and since this is such an important educational feature it should be encouraged; and in order to get the most out of it the best plays and recitations must be provided. For this reason the General Extension Division has made a collection of one hundred (100) recitations and four hundred (400) plays suitable for school and amateur use, including a few dialogues, drills, tableaux and operettas, which it lends upon request. Many schools were served by this bureau when they were preparing for closing last Spring. This Fall we have had all the calls we could fill.

Play and Recreation.—The value of the proper kind of play and recreation for children of all ages, as well as grown-ups, is recognized; consequently the Extension Division assists communities in developing their recreational facilities for their own school children, adults and for tourists by offering the services of a specialist on playgrounds and equipment.

Books on games, supervised play and recreation of all kinds, also suggestions for playground equipment and supervision are lent.

Educational Information.—Through this bureau the division also attempts to give help on subjects pertaining to educational work. To assist in this, current copies of sixteen (16) of the best magazines are kept on file. When information desired is found in a magazine the magazine is lent to the inquirer just as a book would be lent. If the information has appeared in some other magazine which is not on file the reference is supplied and the suggestion made that the magazine can be secured from the local library or direct from the publishers. These magazines which are kept on file will be clipped for package libraries when enough have accumulated.

Story Books.—Good stories build character, and story-telling is especially important in the smaller schools where no library is available. To enable the teachers to get the best stories to tell the children and to help them appreciate the value of story-telling in the education of the child, a carfully selected collection of story books for children from the first to the eighth grades has been purchased and is being circulated for the first time this Fall. This collection is made up of eighty-five (85) books and is being added to from time to time. A bulletin listing these books, with suggestions for story-telling, is now in the hands of the printer and will be sent to every primary teacher in the State.

Reference Books.—Special reference books purchased by the division to be used by correspondence study students and instructors are also handled by this bureau.

B. C. RILEY, Director.

SUPPLEMENT A

FIRST ANNUAL REPORT FROM OCTOBER 1, 1919, TO SEPTEMBER 30, 1920.

THE GENERAL EXTENSION DIVISION

EXTRACTS FROM LETTERS OF A FEW CORRESPONDENCE STUDY STUDENTS.

A young man, a pupil at the school of which I had charge last year, made so fine a record in his studies that I recommend him for a county scholarship, which he received. This young man did most of the work on his father's farm, his father being incapacitated. * * * Think of the advantages your correspondence offers to him. Think of the opportunity thus offered to ability and ambition. Another term at school was forbidden him because of increasing tasks at home which even a 3:30 A. M. rising hour couldn't remedy. Your course was a godsend. * * * In my own case the war interrupted my college course, and now I am enabled to go on with the studies while engaged in other work. One may go ahead at his own gait in a course which is as comprehensive and carefully taught * * *.

BOYD CARLTON, Alachua County.

Your study course is all one could expect, and is the very thing to enable poor, struggling people who are struggling for an education to reach the top round.

MISS VERNA MARTIN, Alachua County.

The General Extension Division of the University of Florida is a great help to the ex-soldier and sailor and for those who cannot avail themselves of the opportunity of attending some good school.

HAROLD A. TURNER, Baker County.

The Extension Division of the University of Florida is grand, as it gives the people of Florida who haven't the money and time to go to school an opportunity to become better educated.

NINA F. STEWART, Brevard County.

I yet hope that "poor as I am" my daughters may get a little education that will be real education through your instrumentality, and in view of same please accept my most sincere thanks.

R. B. LEES, Bradford County.

I can truthfully say that I have received more benefit and knowledge from the extension work than from some normals I have attended. I feel that it will be such a help to me in teaching. I shall help all I can in spreading the good news. With best wishes for a great and glorious success in this splendid work.

MRS. ROSA CAMPBELL, Citrus County.

Enjoy my course very much, and hope to complete it soon and be ready to take some other course after the holidays.

MATHILDE NILES, Dade County.

I certainly thank you for your willingness to help me, and I want to tell you that I have gotten more good from this journalism course of yours than from all my previous journalistic experience—and that experience covered a period of about five years.

B. E. ARCHER, Dade County.

It was just what I needed, as it gives me a chance to study at home, and at the same time look after our homestead in my father's absence.

HAROLD E. HAMMAR, DeSoto County.

I was sorry that the first girl I appointed as a scholarship student dropped the course, but I am glad that I was able to get her into high school. It was through the correspondence course that I got her interested in the thought of high school and found that a way could be provided for her to go.

CLARINE HOYT, Home Demonstration Agent, Duval County.

The good records I have made on the courses I have taken under the General Extension Division have bourne out what I have always claimed —that a correspondence course can take place of actual class attendance.

THEODORE OBERDORFER, Duval County.

The General Extension Division is a great thing for the working boys who are not financially able to go away to school.

JAMES M. HEMMINGER, Hillsborough County.

The opportunity to study in this way has been my desire for years. I love to learn, but for various reasons was unable to go beyond the sixth grade. Have had to struggle along with books to the best of my ability. I sincerely hope the school will continue.

J. E. NYBERG, Hillsborough County.

It is one of the best additions the promoters of the same could have instituted in the foremost university of our State. It is already showing great good, and by the co-operation of the patrons and good citizens of our proud State, it should continue to grow and be one of the shining lights in the educational world.

W. L. FAIRCLOTH, Escambia County.

I took the examination on June 1st, and have received my first grade certificate. I passed my arithmetic examination with no trouble at all and feel that I owe my success in it to the correspondence-study course and to the help that you gave me.

ANNIE C. MAYES, Lake County.

You are offering the people of Florida—what commercial schools would charge us large fees for.

MR. L. W. BAUM, Lee County.

Through my son, Edward E. Baum, who is taking one of your popular correspondence courses, I have become interested in your work, and take this opportunity to congratulate you for the fine educational service you are doing for the people of Florida.

H. P. BAUM, Lee County.

The Extension Division is a wonderful thing for the young people who are unable to attend school in a regular way.

DAISY A. DOUGLAS, Marion County.

I have studied many courses by correspondence from many universities of the country, but no course I have yet studied will compete with the course put out by the University of Florida.

E. F. HOLLAND, Madison County.

I do not know of anything that has been undertaken by the University of Florida that can be of greater benefit to those living in the rural districts who have limited school advantages than this splendid study department in correspondence courses.

MRS. C. V. S. WILSON, Manatee County.

Your course is a fine thing for every housewife and every club woman who is interested in her town and community.

MRS. ESTELLE BURRIS, Manatee County.

Allow me in closing to thank the teachers for their criticisms and the personal attention given to every lesson. These lessons have been of great benefit to me.

MRS. NELLIE M. COCK, Okaloosa County.

I must thank the University of Florida for this wonderful work, which is "seldom equalled, never excelled."

MRS. JOS. NEFT, Palm Beach County.

Of great value to all who desire to obtain knowledge necessary for him to succeed in his chosen vocation and help in the development of this great State.

A. A. JANECKE, Polk County.

I appreciate so much what the division has done for me and hope to show my appreciation by good work accomplished.

MRS. HATTIE MAYO, Putnam County.

I think the Extension Division a very wonderful help to all students wishing to improve their education. The instructors make you feel they have a personal interest in each particular case. The definitions are made very clear, and the work is thorough.

MRS. HATTIE MAYO, Putnam County.

I was a proud and happy boy when I received notice that I had been awarded a scholarship. I enjoy my work with the General Extension Division, and think it is a very good thing for students like me who find it inconvenient to attend college. I farm in the daytime and study my lessons by night. By doing this it does not take up any of my time when I could be working.

RODNEY KROEGEL, St. Lucie County.

I am delighted with the courses I am taking with the correspondence-study department of the university. This department offers the greatest opportunities that have ever been brought before the teachers of Florida.

H. C. THITCHENER, St. Johns County.

I regret not knowing it from its beginning. However, when I did learn of it, it seemed so full of promise that I was afraid my request for enrollment would bring news that all had been enrolled that could be accommodated.

F. S. KNIGHT, St. Johns County.

I wish to say that the information given to me through the correspondence-study is of much benefit. "It's a blessing to the people of Florida."

RUFUS CHAUNCY, Suwannee County.

I want to extend my sincere thanks to the teachers of this department for the consideration shown me, and will say that though I think I have had some very good instruction, these outlines are the best and most complete I have ever used. I would like to say—that—correlate the grammar schools with the University of Florida, and have the grade teachers use the outlines sent out by the correspondence-study department—for real efficiency at the completion of the work. Tell Dr. Murphree that I say, for the sake of the children of this State, to have this work directly correlated with the public school system. This would make strong a united school system, and would give both teachers and pupils a strong source of correct supervision.

SHELTON SOUTER, Marion County.

FIRST ANNUAL REPORT FROM OCTOBER 1, 1919, TO SEPTEMBER 30, 1920.

NOTE—Extension Teaching Department was established December 1, 1919, therefore, following report is for ten months.

SUPPLEMENT B.

NEEDS OF THE GENERAL EXTENSION TEACHING DEPARTMENT.

Correspondence Study.—The General Extension Division is now handling three hundred and fourteen (314) registrations in high school subjects, three hundred and sixty-two (362) in normal subjects and about four hundred (400) in special courses, largely with the extension staff. Others handle a few of the special subjects. Members of the college faculties take care of students enrolled in college subjects.

The enrollment in correspondence study will be tripled in the next two years; consequently more extension instructors are needed unless the number of students is to be limited. At least three instructors for subjects below college grade should be added to the extension staff. For further recommendations in correspondence study see next paragraph.

Extension Teaching.—Many groups of teachers have asked for class instruction, especially in courses in education and English. Because we have been forced to use regular faculty men for this work, we have not been able to supply the demand. Practically every county needs and has asked for a class in professional subjects for teachers sometime during the year. With three hundred and sixty-two (362) registrations in correspondence courses for teachers, and with the present demand for class work, we should have at least one man in education for general work in the State as soon as possible. It would be well to plan eventually to have such an instructor, who could also act as a general field agent in each of the five districts of the State proposed for the development of extension work. These instructors should be of the highest order and capable not only of conducting classes but correcting correspondence papers in education for normal and college credit, since through correspondence study alone can we reach the teachers in isolated districts.

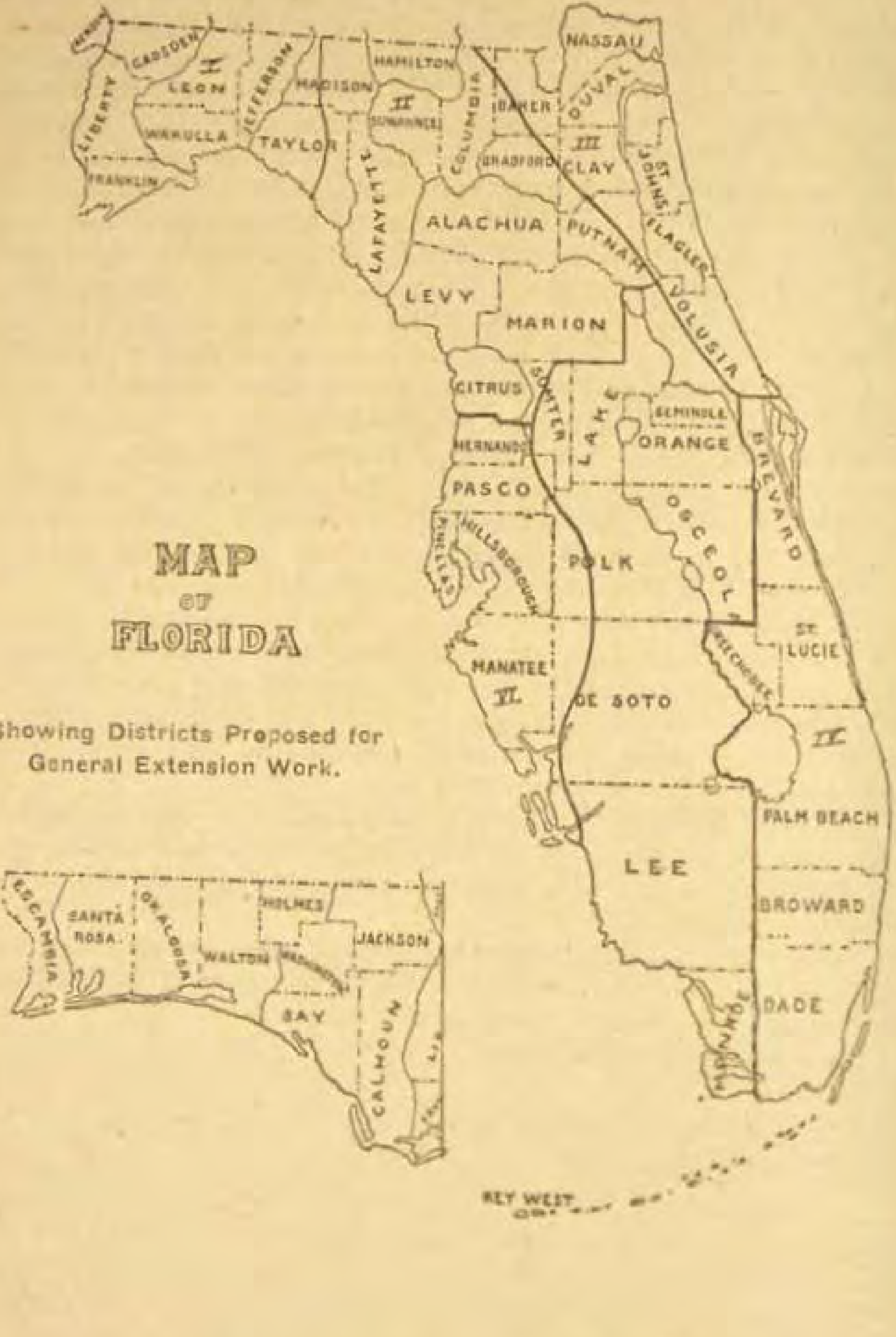
There is also a great need for the services of an English professor. One hundred and fifty-six (156) students are now taking English. Seventy-three (73) of these are taking it for college credit and the remainder are taking the high school and business English; consequently, the instructor secured should be capable of handling classes and correspondence study work of college grade for credit and courses in business English.

An instructor in mathematics is needed. One hundred and seventy-six (176) are taking this subject. An instructor in history and economics also will be necessary before a great length of time has elapsed. It may be well to mention the fact that while among those enrolled the women slightly out-number the men, it has been more difficult to give men the courses they most desire because we do not offer instruction in engineering and other practical subjects bearing directly on their work. It is hoped that this field can be developed soon.

The General Extension Division is making the University of Florida a school for all the people of the State, and we can only expect the demand upon this department to increase as the enlarged usefulness of the university is recognized.

To summarize, three instructors for subjects below college grade are the greatest present need; following this, in the order of the subjects named below, full-time instructors should be secured:

1. Education and Normal Subjects.
2. English.
3. Mathematics and allied subjects.
4. History and Economics.



MAP OF FLORIDA

Showing Districts Proposed for General Extension Work.

BUDGET FOR THE GENERAL EXTENSION DIVISION 1921-1923.

Part I.		Old Budget	Proposed Budget
1. Salary of Director	One Year	$ 3,000	$ 3,500
2. Salary of Field Agent	" "	3,000	2,750
3. Salary of office assistants, stenographers, clerks and librarian	" "	2,700	2,700
4. Extra pay for professors engaged in outside work, estimated for 352 days at $5.00 per day	" "	1,760	1,760
5. Extra pay for students assisting in office (and outside work)	" "	3,000	3,000
6. Pay for lecturers (and other part-time General Extension workers).........	" "	500	750
Note: College professors will be expected to take care of college correspondence courses.			
7. For instructors to handle High School, Teachers' Review and other courses by correspondence	" "	.....	4,500
		$13,960	$18,960

Appropriation for items listed above may be transferred from one to another as need may arise.

Part II.			
1. Traveling expenses for Field Agents, estimated 150 days at $7.00 per day	" "	$ 1,050	$ 1,050
2. Traveling expenses for professors (and students engaged in outside work).	" "	1,290	1,290
3. Traveling expenses for lectures (and other General Extension workers)..	" "	500	500
4. Contingencies, telegrams, researches, advertising and extra salaries......	" "	1,500	1,500
		$ 4,340	$ 4,340

Appropriation for items listed above may be transferred from one to another as need may arise.

Part III.

1. Subscriptions for periodicals, (books and reference material)	"	"	$ 500	$ 500
2. Printing	"	"	1,200	1,200
3. Postage	"	"	1,500	1,500
4. Purchase (preparation and reproduction of correspondence courses)....	"	"	1,000	1,000
5. Purchase of slides and films (and all necessary equipment and its maintenance for visual education)	"	"	2,000	2,000
6. Purchase of filing cases, writing machines and other office furniture....	"	"	500	500
			$ 6,700	$ 6,700

*Appropriation for items listed above may be transferred from one to another as need may arise.

Total	$25,000	$30,000
Add for second year	25,000	30,000
	$50,000	$60,000

NOTE—The words in parenthesis have been added to make clear various portions of the old bill. The addition of these words and phrases in the new bill, particularly the starred sentence, is imperative.

A BILL.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF FLORIDA.

Sectcion 1. The State Board of Control is hereby empowered and directed to extend the outside work of the educational institutions under its direction into all fields of human endeavor which, in its judgment, will best accomplish the objects herein expressed.

Section 2. It shall be the duty of the Board of Control to gather information on all subjects useful to the people of Florida, and to carry it to them in ways that will help them most in the shortest time; to spread knowledge among them by taking it to them in an attractive way; to stimulate thought and encourage every movement among the people for their mutual improvement.

Section 3. To carry out the provisions of this Act, the Board of Control is hereby empowered to enlarge the work done by the Extension Divisions of the University of Florida, and the State College for Women, as it may from time to time deem advisable, and to employ all needful persons and appliances to carry on the work in the most efficient manner.

Section 4. It shall be the duty of the Board of Control to seek out, among the schools of Florida, every student who may by nature have a special aptitude and genius for some one branch of learning, and to encourage him in the prosecution of the study of that branch, to the end that he may become an expert and a leader in that subject.

Section 5. The sum of $50,000, or so much thereof as may be necessary, is hereby appropriated out of the general revenue fund to carry out the work herein authorized, for a period of two (2) years and one (1) month from June 1st, 1919, to June 30th, 1921, and shall be expended as follows:

To the President of the University of Florida:

In placing before you the condition of the library of the University of Florida, it is only stating a fact, which to both faculty and students must long since have become obvious, to say that our present library facilities are entirely inadequate to the needs of the university.

What the laboratory is to the departments of science, the shop to the engineering departments, and the farm and experiment station to the College of Agriculture, the library is to the languages and political and social sciences. It is impossible for the College of Arts and Sciences and the Teachers' College to do their best work without adequate library facilities.

But there is a larger need of a better library. In no institutions of higher learning can an atmosphere of earnest and diligent scholarship and research be fostered to the highest advantage without a smoothly-run library with the right kind of books. Back of technical excellence in his special line of work, the university man must be well-read and broadly trained, and for this the library is a first requisite.

The needs of our library may be summed up in the one phrase, namely—**lack of adequate funds.** A brief comparison of the conditions in our library with those that obtain in fifteen other institutions (mainly Southern) of about the same size and scope as our own may be helpful.

The institutions which have been made the basis for this comparison are: The Universities of South Carolina, North Carolina, Tennessee, Texas, Arkansas, Nebraska, Iowa, Washington, Colorado, Indiana, Purdue, Miami; and Virginia Polytecnic Institute, Oregon State Agricultural College, and Northern Illinois State Normal School. This comparison shows:

(1) That of the fifteen above-named institutions twelve have separate library buildings; while the library of the University of Florida is crowded into temporary quarters in Peabody Hall (Teachers' College)—quarters so poorly ararnged for library use, so badly crowded and poorly lighted that our present library work is severely hampered.

(2) That the average book fund of fourteen universities from the above group is $3.81; while that of the University of Florida is only $1.56 per student, or less than half of the average of these institutions.

(3) That the library budget fund, averaged per student for ten universities, is $8.23; while that of the University of Florida is only $1.00, or less than one-eighth of the average.

(4) That the average help in the fifteen institutions aboe named is one full-time trained librarian for each 226 students; while Florida has one full-time trained librarian for 1,276 students, less than one-fifth of the average.

(5) That, even figuring the student part-time help on the basis of full-time trained assistants, the library of the University of Florida is being run on less than half the force used in the other fifteen institutions. It must be remembered that these student assistants have neither the time, experience, nor training of expert librarians.

(6) That Florida pays her librarian only $1,700, which is $12 less than the average of the 15 institutions pays the assistant librarian; while the librarians of these other institutions receive an average salary of $2,693, or nearly $1,000 per year more than we pay our librarian.

These comparisons show clearly that Florida is trying to do with no library building, inadequate maintenance and book fund, insufficient and poorly paid help, library work that in most institutions is far better provided for. Indeed many of the small sectarian and privately endowed institutions, have far better library facilities than our State University.

What the University of Florida needs is:

(1) An adequate library building, of fireproof construction, with properly arranged stacks, reading and reference rooms, and offices.

(2) A full-time assistant librarian, trained in library work, in addition to our present staff.

(3) A budget of $5,500, about double our present biennial budget. This increase is necessary to meet the increased cost of maintenance.

(4) A book fund of $7,500 instead of $5,000 (which was cut to $4,000 in the last biennium). This increase is imperative to meet the great rise in prices of books, magazines, periodicals and newspapers.

(5) More adequate compensation for our librarian upon whose efficiency much of the success of our library work must depend.

In concluding this report it might be well to emphasize the statement that no university can foster the highest scholarship unless it provides adequate library facilities for its faculty and students.

CORA MILTIMORE,
Librarian.

Approved: JAMES MILLER LEAKE,
Chairman Library Committee.

REPORT OF THE FLORIDA STATE MUSEUM.

Office of the Director, November 27, 1920.

Dr. A. A. Murphree, President,
University of Florida,
Gainesville, Florida.

My Dear Sir:

The following is an abridged report of the general activities of the Florida State Museum for the period of July 1, 1918, to June 30, 1920, together with recommendations for the period of July 1, 1920, to June 30, 1922, which I submit for your approval and recommendation to the State Board of Control.

The law creating the Florida State Museum states that "the director shall make an annual report of the expenditures and general work of the department to the State Board of Control, which said board shall publish." The size of the report and its distribution is not mentioned, but it was the sense of the drafters of the bill that the report should exploit the activities of the museum in a manner in keeping with the same of other museums and similar institutions, and to distribute them as a reciprocation to the many institutions that continually favor us with their publications, and also to the contributors to the museum and to the citizens of the State in general, as a means of furthering their interest and co-operation. When we consider these things, and then the volume of work accomplished, it is with regret that we must confine our report to a limited few pages.

Since our last report we have received and recorded 185 accessions, making the total of 950 accessions to date. We would like to specifically state these accessions, and in justice to the contributors, should do so, but space forbids. We would state, however, that the number and value of these collections are greater than for any previous period.

Cataloguing has been going steadily on as time would admit. To date there are 169,344 specimens given catalogue numbers and recorded with typewritten cards. This is but about one-half of the number of specimens now in the museum. The greater portion of this material lies hidden away in inaccessible and poorly provided quarters. When we consider these activities and the amount of material acquired we congratulate ourselves.

In soliciting specimens or collections, when the people know the material is not going to be put to use, nor even given better protection than they themselves can afford, the reply generally is that they may as well keep it themselves. On the other hand, when they are aware that it will be placed in safe quarters and put to the purpose it was intended, such as fire-proof, dust-tight exhibition or storage cases, and made accessible with the information concerning them, given in an educational and concrete manner, then solicitation becomes a pleasure and supporters rally to asist. We know that the first thing to be done in building a museum is to get the material (specimens), as we cannot expect the people to come forward with a fine building, cases and equipment when there is nothing to put in them. On the other hand, it is generally expected by those having the collection; so the museum pioneer is constantly "between two fires." A remark made by an official recently reached our ears that there was not $10,000 worth of material in the museum. We want to say to this person that he could not duplicate it for ten times that amount. We have no enmity for this gentleman for his statement, for it is just the impression that anyone would gain from what can be seen, and more especially by those incompetent to judge. An illustration is, if we point out to a person a big box, telling him that it contains five thousand sheets of botanical specimens and that it is worth so many dollars, it does not appeal to him at all. He will hardly hear what we are telling him, but if he sees this same collection properly displayed in cases with the information accompanying it, one glance would be sufficient, and we need not say a word; he at once becomes our supporter. We have this identical collection, and smaller ones, also many other collections of far greater numbers and value, but who knows it? Your director does, and quite likely the people who gave them years ago still remember them, although several have died off in despair of ever seeing them in the light.

While we have all this vast amount of valuable material, yet we have not enough to warrant a new building, and it would be just as absurd to ask for it as it would be to remain as we are now. "The happy medium" must first be struck, and probably more than once. The mistake has too often been made of putting up a building for a museum and then finding that they have apparently nothing to put in it. Modern equipment for a museum costs equally or more than the building itself, and while a collection may make a showing in a small room, yet it will be lost in a large one, besides moving is always attended by disaster.

SUMMARY.

Resources—		
Cash on hand July 1, 1918	$ 465.14	
Total receipts from July 1, 1918, to June 30, 1919	35,104.08	
Total receipts from July 1, 1919, to June 30, 1920	31,566.92	
Total		$67,136.14
Disbursements—		
Total from July 1, 1918, to June 30, 1919	$34,384.19	
Total from July 1, 1919, to June 30, 1920	32,638.36	
Total		$67,022.55
Balance on hand July 1, 1920		$ 113.59

RECEIPTS AND DISBURSEMENTS ITEMIZED.

—Receipts—

	1918-1919	1919-1920
Balance July 1, 1918	$ 465.14	....
July	1,623.87	1,468.39
August	6,305.51	911.48
September	5,113.49	1,206.75
October	1,483.86	2,106.55
November	1,990.56	2,308.39
December	2,457.97	2,882.48
January	2,675.95	3,407.02
February	2,726.17	2,979.27
March	2,706.11	3,104.21
April	2,464.91	2,790.86
May	2,983.65	3,501.59
June	2,572.03	4,870.43
	$35,569.22	$31,566.92

—Disbursements Itemized—

	Groceries.		Meat and Eggs.		Butter.	
	1918-1919	1919-1920	1918-1919	1919-1920	1918-1919	1919-1920
July ..	$ 1,092.87	$ 1,033.10	$ 138.04	$ 488.70	$ 1.72	$ 83.86
Aug. ..	1,414.57	248.79	908.76	46.97	71.19	1.50
Sept. ..	1,455.06	145.00	942.98	48.96	121.90	.65
Oct. ..	422.43	1,239.96	121.50	476.35	5.05	93.20
Nov. ..	787.33	896.86	203.39	470.85	......	51.56
Dec. ..	628.29	992.83	263.61	645.33	91.57	54.43
Jan. ..	927.25	1,241.10	328.67	531.81	36.12	2.76
Feb. ..	523.15	703.80	254.16	647.28	43.43	81.93
Mar. ..	1,125.79	1,232.78	332.33	899.16	21.82	76.50
April ..	770.07	1,208.29	392.84	195.55	46.98	21.70
May ..	735.89	1,475.30	460.16	510.15	37.23	78.30
June ..	577.12	1,696.62	493.74	974.26	43.72	168.45
	$10,459.82	$12,114.43	$ 4,840.18	$ 5,935.37	$ 520.73	$ 714.84

—Disbursements Itemized—

	Milk.		Lights.		Fuel.	
	1918-1919	1919-1920	1918-1919	1919-1920	1918-1919	1919-1920
July ..	$ 33.82	$ 54.08	$ 55.43	$ 5.50	$	$ 79.90
Aug. ..	81.84	......	106.39	......	72.16	153.20
Sept. ..	67.15	......	105.94	......	153.55	14.00
Oct. ..	119.42	14.45	23.34	......	234.29	98.25
Nov. ..	144.77	43.95	56.80	99.50	77.40	66.08
Dec. ..	65.91	64.35	......	......	285.88	331.48
Jan. ..	61.78	101.59	98.38	151.97	87.75	7.00
Feb. ..	46.90	102.17	62.32	108.38	56.25	2.00
Mar. ..	57.98	103.79	96.10	137.24	50.00	55.00
April ..	75.50	24.30	103.67	166.35	62.10	95.58
May ..	40.72	22.33	93.98	123.20	62.74	13.00
June ..	28.00	71.49	......	116.82	......	117.15
	$ 823.79	$ 602.50	$ 802.35	$ 908.96	$ 1,142.12	$ 1,032.64

	Laundry.		Ice.		Supervisors' Salary.	
	1918-1919	1919-1920	1918-1919	1919-1920	1918-1919	1919-1920
July ..	$ 36.48	$ 10.41	$	$ 64.10	$ 95.00	$ 90.00
Aug. ..	16.00	20.16	82.00	57.20	95.00	127.50
Sept. ...	......	6.75	116.00	74.60	120.00	......
Oct. ..	1.99	48.90	......	......	37.50	60.00
Nov. ..	30.49	67.95	18.00	50.60	90.00	140.00
Dec. ..	131.63	147.90	......	44.70	90.00	140.00
Jan. ..	80.50	125.83	64.50	58.50	90.00	140.00
Feb. ..	36.30	87.45	31.30	44.40	90.00	140.00
Mar. ..	22.21	73.10	31.25	43.40	90.00	140.00
April ...	61.80	85.45	26.30	28.30	130.00	140.00
May ..	11.90	253.19	36.25	33.75	119.50	165.00
June ..	46.01	39.97	.30	61.55	192.50	130.00
	$ 475.31	$ 967.51	$ 405.90	$ 551.10	$ 1,239.50	$ 1,412.50

—Disbursements Itemized—

	Labor.		Incidentals and Equipment.		Music	
	1918-1919	1919-1920	1918-1919	1919-1920	1918-1919	1919-1920
July ..	$ 96.50	$ 45.50	$ 358.63	$ 486.18	$ .50	$ 25.84
Aug. ..	346.13	76.58	*2,701,35	322.78	......	10.00
Sept. ..	9.00	74.55	*2,319.27	247.16	3.03	......
Oct. ..	77.75	6.00	526.03	300.15	......	......
Nov. ..	63.00	55.00	610.70	560.14	75.00	50.00
Dec. ..	39.00	119.93	639.17	363.84	75.69	99.00
Jan. ..	84.10	......	890.38	914.16	95.00	50.00
Feb. ..	39.00	70.00	1,349.12	886.70	96.50	53.00
Mar. ..	......	60.00	892.38	337.14	75.00	60.76
April ..	78.00	......	583.07	711.38	75.00	50.00
May ..	40.50	90.00	1,025.09	559.30	75.00	53.95
June ..	......	3.20	260.60	1,588.27	75.00	68.00
	$ 872.98	$ 800.76	$12,155.79	$ 7,277.20	$ 645.72	$ 520.55

*Including cash advanced to U. S. Training School for Instruction.

—Number in Boarding Department—

	1918-1919	1919-1920
July	258	156
August	254	153
September	10	15
October	217	287
November	250	292
December	265	291
January	272	281
February	261	281
March	253	276
April	241	277
May	232	264
June	151	180

During the summer of 1918 the Boarding Department faced the difficult problem of feeding a United States Army Training School detachment in addition to the regular Summer School for Teachers. The rapid rise in cost of food and service, existing at that time and increasing continuously thereafter, necessitated rigid economy and retrenchment, which still give concern.

The laundry work include the washing and ironing of the linen used in the dining room, besides all the linen of the young men students. Every girl is required to do her own laundry work. Opportunity to help defray expenses by extra work in the school laundry is given those who may desire it. Outside help is reduced to the lowest terms.

The same can be said of the dining room and kitchen. Students earn part of their board waiting table and otherwise assisting in the refectory.

Incidentals herein designated take in purchases of supplies for refectory and dormitories, refunds, freight and money sometimes advanced to other funds to pay labor and urgent bills. When refunded these amounts are contained with cash under receipts.

Supervisors' salaries include matrons of dormitories, as well as persons in direct charge of the dining room and kitchen.

Expenditures for music are covered by receipts from music students and embrace instrument repairs, chapel hymnals, salary of instructor and band supplies.

Respectfully submitted,

J. F. MATHEUS, Auditor.

INDEX

Page.

Agricultural and Mechanical College for Negroes.... 299
Board of Control Membership.... 3
Board of Control Report.... 7
Detailed Budget for the Experiment Station and Field Work.... 86
Experiment Station, Reports From.... 99
Financial Statement, Secretary Board of Control.... 12
Florida State College for Women:
- Report of the President.... 221
- Report of the Dean of the College of Arts and Sciences.... 271
- Report of the Dean of the Normal School.... 273
- Report of the Dean of the School of Music.... 269
- Report of the Dean of the School of Home Economics.... 267
- Report of Home Demonstration Agent.... 244

Recommendations of the Board of Control.... 37
Recommendations for Summer Schools.... 46
School for the Deaf and the Blind.... 280
University of Florida:
- President's Report.... 47
- College of Agriculture.... 79
- College of Arts and Sciences.... 71
- College of Education.... 164
- College of Engineering.... 148
- College of Law.... 160
- Report of General Extension Division.... 170

RE D 1 R.
920

REPORT

OF THE

BOARD OF CONTROL

OF THE

State Institutions of Higher Learning of Florida

FOR THE
BIENNIUM ENDING
JUNE 30, 1920

1921

T. J. APPLEYARD, PRINTER, TALLAHASSEE, FLORIDA